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FOURTEENTH MONTHLY REPORT
OF THE
OREGON
STATE WEATHER BUREAU

In Co-operation with U. S. Signal Service.

REPORT FOR MONTH OF MAY, 1890.

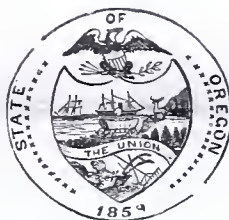
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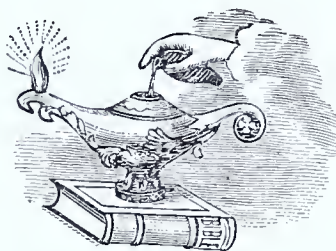
—BY—

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CENTRAL OFFICE, PORTLAND. OREGON.



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BULLETIN FOR MAY, 1890.

GENERAL CONDITIONS.

The month is marked for its average high temperature and light rainfall, being one of the warmest and driest Mays on record.

The barometric pressure was quite steady, and, excepting the rapid rise on the 11th, the changes were regular and slow. On the 10th was the only well-developed storm of the month, and the wind accompanying it was only brisk in force. The low pressure on the 10th was accompanied with light general rains.

The month opened with a high temperature and closed with a low one. The temperature was quite high up to the 8th, 9th and 10th, when it fell, allowing frosts in sections of the eastern part of the State which did damage to vegetation. Frosts also occurred on the 21st, 27th, 28th, 29th and 30th which did damage in Eastern Oregon, freezing temperature reported, injuring even the cereal crop in sections; and in Western Oregon it was only in a few places that light frost, which did no damage, was observed.

While the average temperature for the month is high, the changes were rapid, and it fell more frequently than usual to the frost point. The season from January 1st to April 20th had been very wet, unusually so, but from the latter date extending to the close of May the rainfall was very light, the winds unusually warm and dry: as a result, the soil was dried out and the crops are in need of rain. This is especially true of the late spring-sown grain. The weekly "Weather-Crop Bulletins" which were issued during May, are given in this report, and from them the crop conditions from week to week can be followed.

May of 1889 was slightly warmer than the present month, and it had more rainfall.

BAROMETRIC PRESSURE.

(Reduced to Sea Level.)

The highest pressure occurred on the 13th; the lowest on the 7th, 10th, 26th, 27th.

The low pressure on the 10th and the high on the 13th were quite well defined.

The low on the 10th was accompanied by general rains. The low on the 26th was followed by general rains and low temperature.

TEMPERATURE.

(Expressed in degrees and tenths, Fahr. scale.)

The mean temperature of the State for May, 1890, was 58°.1, being 2°.6 above the normal. The mean and excess for the various districts is as follows:

District.	Mean.	Excess.
Coast.....	56.4	- -4.7
Willamette Valley.....	59.0	- -2.4
Southern Oregon.....	59.7	- -2.2
Eastern Oregon.....	57.2	- -1.2

The above shows the coast to have had the greatest excess and Eastern Oregon the least.

The highest monthly mean, 63°.4, is reported from Hood River; the lowest, 52°.9, from Joseph. The mean temperature was above 50° in every section, and was more than 8° warmer than April, also nearly one degree warmer than May, 1889. The mean was above 60° in Multnomah, Jackson, Josephine, Wasco and Umatilla counties.

The maximum, 98°, is reported from Grant's Pass on the 25th; the minimum, 24°, from Burns, on the 26th and 27th, and from North Powder on the 30th. The extremes this month are greater than the corresponding month last year, when the maximum was 93° and the minimum 25°. The maximums occurred on the 2d, 4th, 5th, 6th, 7th, 15th, 25th, 26th, and the minimums on the 9th, 11th, 27th, 28th, 29th and 30th, showing a considerable variation in the temperature.

The maximum was 85° or more in every section except along the coast, where it was from 72° to 87°.

The minimum was above 35° except in Eastern Oregon, where it was below the freezing point except in the northern part of Umatilla county. The temperature below the freezing point did considerable damage to crops, as the crop reports show.

The mean maximum in Western Oregon ranged from 78° at Grant's Pass to 59° at Fort Canby; in Eastern Oregon, from 76° at Hood River to 66° at Joseph. The mean maximum was generally above 70° in all parts of the State, except along the immediate coast. The mean minimum in Western Oregon ranged from 54° at Bandon to 44° at McMinn-

ville; in Eastern Oregon from 51° at Hood River to 37° at Jordan Valley. The mean minimum was generally above 45° in Western Oregon and below 45° in Eastern Oregon.

The range in Western Oregon was from 28° at Bandon to 64° at Grant's Pass; in Eastern Oregon from 48° at Hood River to 61° at Pendleton and Beulah.

Temperatures of 90° or more are reported from Grant's Pass, Pendleton and Walla Walla; of 40° or less from every section of the State; of freezing or below from all of the counties east of the Cascades except Umatilla.

PRECIPITATION.

(In inches and hundredths, including rain, melted snow, sleet and hail.)

The precipitation is below the average in every section of the State. The average for the State as a whole is 1.03 inches, which is 1.14 inches below the May average. The deficiency of the present month is in marked contrast with that of 1889, when it was generally in excess of the average.

The average amount that fell in each district and the departure from the average is as follows:

District.	Average.	Departure.
Coast.....	0.98	-2.78
Willamette Valley.....	0.62	-1.47
Southern Oregon.....	1.22	-0.24
Eastern Oregon.....	1.30	-0.06

The average amount is greater, and the departure from the average is less in Southern and Eastern Oregon than in other parts of the State.

Along the coast from $\frac{1}{4}$ to $1\frac{3}{4}$ inches of rain fell. In the Willamette valley generally less than .75 of an inch; in Southern Oregon from .35 to 1.91 inches, and in Eastern Oregon from .19 at Hood River to 3.24 inches at La Grande. In Jackson, Umatilla, Union and Baker counties the precipitation was nearly normal in amount.

The deficiency for the month ranges from 50 to 150 per cent.

For the season from July 1, 1889, to May 31, 1890, the precipitation is nearly normal in Western Oregon, and deficient in Eastern Oregon. The seasonal precipitation ranges from 59 to 95 inches along the coast, from 31 to 52 inches in the Willamette valley, from 25 to 47 inches in Southern Oregon, and from 10 to 18 inches in Eastern Oregon. At the Cascade Locks 75 inches fell, at Hood River 31 inches.

Snow fell on the higher mountains, 9th, 28th and 29th. No snow is reported from the lower lands. Rain fell on 8th, 9th, 10th, 11th, 12th, 19th, 28th, 29th, 30th and 31st. One inch or more in twenty-four hours fell at Ashland, La Grande and Jordan Valley.

WINDS.

(Velocity from self-registering anemometers.)

The prevailing direction of the wind was from the southwest. On the 5th, 6th, 7th, 16th, 19th, 24th and 27th gales of from 24 to 48 miles an hour were experienced in various sections. There is no severe or unusual storm reported.

The average hourly velocity of the wind, in miles and tenths, from places having self-registering anemometers, is as follows: Fort Canby, 9.7; Portland, 5.5; Forest Grove, 1.6; Corvallis, 8.8; Roseburg, 3.8; Walla Walla, 7.3; Spokane Falls, 5.3; La Grande, 1.5; Baker City, 6.0; Boise City, 5.0.

WEATHER.

Seventy-two per centum of the days were cloudless or partly cloudy, and 28 per centum cloudy. Rain fell on 20 per centum of the days.

The greatest number of cloudy days, 18, is reported from Grant's Pass; the least number from Hood River. The greatest number of days on which rain fell, 12, from Fort Canby; the least number, 2, at Burns, Harney county. The weather during the fore part of the month was favorable to crops; the latter part unfavorable, owing to the variable and cool temperature and lack of rainfall.

FROSTS.

Slight frosts occurred in sections of Western Oregon, doing very slight damage to tender plants and vines, and heavy killing frosts were general in Eastern Oregon, doing great damage in some counties, especially Crook and Gilliam. The fruit was damaged in Union, Wallowa, Baker and Malheur and in the interior counties. The most damaging occurred on the 20th, 28th and 30th, being the latest on record.

Dates of frosts reported as follows: Vernonia, 17th, 21st; East Portland, 21st; Roseburg, 28th; Heppner, 9th, 20th, 22d, 28th, 29th, 30th; Lone Rock, 13th, 21st, 29th, 30th; ice $\frac{1}{8}$ of an inch thick at Lone Rock on 21st and 30th; Pendleton, 30th; Weston, LaGrande and Telocasset, 29th; North Powder, 13th, 21st, 22d, 26th, 27th, 28th, 29th, 30th; Baker City, 28th, 30th; Boise City, 12th, 13th; Beulah, 12th, 13th, 20th, 22d, 28th, 29th, 30th; Diamond, 9th, 22d, 28th, 29th; Jordan Valley, 28th, 29th; Burns, 27th, 28th.

THUNDER.

Thunder storms reported as follows: Vernonia, 30th; Forest Grove, 30th, 31st; Eola, 10th, 30th; Corvallis and Albany, 30th; Grant's Pass, Jacksonville and Ashland, 5th, 6th; Lone Rock, 6th; Pendleton, 7th; North Powder, 7th, 10th; Jordan Valley, 7th, 9th, 26th.

HAIL.

Hail is reported to have fallen on the following dates: Toledo, 29th; Vernonia, 29th, 30th; Portland and East Portland, 29th; Forest Grove, 30th; Lone Rock, 6th, 29th; Pendleton, 29th.

HALOS.

Solar halos are reported to have been seen as follows: Portland and East Portland, 18th, 26th; Eola, 26th; Albany, 1st, 10th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 21st, 26th, 27th; Corvallis, 18th, 22d, 26th; Ashland, 16th, 17th; Alpine, 14th, 18th, 22d, 26th; Lone Rock, 2d, 7th, 9th, 14th, 15th, 17th, 18th, 19th, 20th, 22d, 23d, 26th, 27th, 31st; Diamond, 18th. Lunar halo reported at Grant's Pass on the 25th.

CORRESPONDENTS' REMARKS.

VERNONIA, COLUMBIA COUNTY.

Up to the 27th everything suffering for rain, since which date rain has fallen and all vegetation is brightening up. This month has been 10° cooler than the corresponding month in 1889. Considerable more rainfall in May, 1889, than in the present month.

PORTLAND.

(Central Office.)

This has been one of the warmest and driest Mays on record. May, 1888, was warmer; May, 1872, and 1888, had less rainfall. The river rose from 1st to 21st, when it fell gradually; highest water in river during the month, 20.1 feet on 21st.

EAST PORTLAND.

The fore part of the month was very dry, the latter part cool. On the 18th a solar halo, followed by 16 hours of light rain. On 21st, solar halo, followed by frost and fog. The solar halo on the 26th was followed by cold rains and hail showers. The ground is cold and tender plants are at a standstill. The health of the city is far from being in a good condition. The frost on the 21st killed the bean and cucumber vines.

FOREST GROVE, WASHINGTON COUNTY.

A very heavy hail storm occurred in the country just north of here on the 30th, which did some damage to young crops. The ground is unusually dry, and crops are backward.

McMINNVILLE, YAMHILL COUNTY.

The month of May has been remarkably dry, the rainfall for the month being but .64 of an inch. Spring-sown grain and hay have suffered very much, and unless we have more rain during the next few days all spring-sown grain and hay will be very short. The last three days of the month have been showery, and to-day (June 1st) the indications are still good for rain. Fall-sown crops, gardens and fruit are doing well.

EOLA, POLK COUNTY.

Grain, grass and gardens are needing rain very much. A copious rain would be of great advantage to all crops, but it is too late for even a liberal supply, should it come, to make full crops of grain; they must of necessity be short. As the month closes the indications give hope of rain. Wind, south; cloudy, with showers around at a distance; barometer, 29.3°.

ALBANY, LINN COUNTY.

On the 30th a thunder storm occurred. First heard at 6 P. M.; last at 6:30 P. M. No lightning visible; direction, from west. Rain fell copiously on the south.

GRANT'S PASS, JOSEPHINE COUNTY.

Owing to the moisture in the ground, the plowing and planting were late, but the grain and fruit look to be in excellent condition. There being plenty of grass on the ranges, stock looks in fine condition. The warm, drying, north winds in latter part of the month have not been beneficial to grain, vegetables nor grass. In the higher and dryer places rain is much needed to insure good, full crops. The frosts of last month have not done as much damage as was feared, and, as it looks at present, Josephine county will yet give a good report on grain, and especially of fruit.

ASHLAND, JACKSON COUNTY.

On the afternoon of May 6th 1.6 inches of rain fell in one and one-half hours, damaging roads and gardens some. The rain which commenced falling on the 31st was badly needed by grain and the late-planted corn.

HOOD RIVER, WASCO COUNTY.

Rain is much needed. The grain and hay crops will be quite light in this vicinity. Grain generally stands this, as it is very short. Early strawberries where irrigated have yielded well, but the low temperature of the last few days has been injurious to the later fruits.

HEPPNER, MORROW COUNTY.

Meteor observed on the morning of 31st at 1:30 A. M., of varied colors and intense brightness, traveling from southeast to northwest, about three seconds in transit. On one occasion the thermometer reached 32°. The last week has been very cold, frosts hurting garden truck and leaves on fruit trees. We had high, dry, northwest winds most of the past week, which, with frosts, have had a withering effect on vegetation.

ALPINE, MORROW COUNTY.

Thirteen days of the month were windy, the remainder had only a light wind; heavy dews on the 5th, 9th, 10th, 11th and 12th. The month has been very favorable to crops of all kind. Not until the last 10 days have we been in need of a good rain, and if it does not soon come crops will be very short.

Wheat is heading out all the way from 10 to 22 inches high, rye from 18 to 30 inches. Without a good rain the average height of wheat will not be over 18 inches and perhaps not over 15 inches. With good rains it would probably average 24 or 30 inches. Potatoes will make a good crop with a little more rain. Corn is growing nicely. The prevailing wind was southwest, and for the last 10 days has been very cool mornings and evenings.

LONE ROCK, GILLIAM COUNTY.

But .48 of an inch of rain fell during the month, which is below the average, but still the ground is in fair condition. The temperature has been above the average, the mean maximum being 69°.2, the mean minimum, 41°.2. The highest temperature, 82°, on the 26th; the lowest, 28°, on the 28th, a change of 54° in 36 hours. Solar halos observed on 14 days of the month. Frost on four days—the 13th, 21st, 29th, 30th. Ice formed to a thickness of $\frac{1}{8}$ of an inch on the 21st and 30th. Thunder storm and some hail observed on the 6th. Wheat promises a good crop, as yet, but needs rain. The wind has blown about an equal number of times from the south, west and east. Stock is in fine condition, and the grass on the range is better than for several years past. The old style grasshopper of Kansas has made its appearance here in quite large numbers, but has not done any damage yet.

PENDLETON, UMATILLA COUNTY.

A heavy thunder cloud appeared from the southwest on the evening of the 7th and moved very slowly to the northeastward; sharp flashes of lightning and peals of thunder continued for an hour from 9 to 10 P. M. without any rain; when the thunder ceased the rain began to fall and continued throughout the night; .65 of an inch fell.

May 14th.—The late rains have cheered the farmers very much, and they are in fine spirits. It gives great assurance of a good crop: something very uncommon must occur to blight the prospect. Our merchants observe that farmers are coming in and purchasing bills of goods which they would not have done a week ago, and the merchant is equally interested in selling his goods.

May 29th.—A wind started up on the 26th from the southwest and continued for about 3 full days, the result being some cloudiness on the 29th, with a little shower. These winds are frequently very bad for the country, but this one was not, as the air became very cool and nothing wilted.

—May 31st.—The frost on the morning of the 30th was very general over the county, but did no material damage except along the river bottoms, where it badly injured some of the gardens. Our rainfall has been but $1\frac{1}{2}$ inches during May, yet the farmers feel well over the outlook for both fall and spring grain. Another good rain would prove beneficial.

WESTON, UMATILLA COUNTY.

The low temperature on the 29th caused frost in some of the exposed positions, but we have learned

of no serious damage being done to any of the crops except garden truck; that is, in this locality. In Adams, Helix, Juniper and other localities to the west, damage was done to wheat, but not to any great extent.

WALLA WALLA.

The Walla Walla valley is now one extended, beautiful wheat field. The season, though about two weeks late, is very promising. The greatest abundance of strawberries and vegetables are now in the market, and tons are shipped daily.

NORTH POWDER, UNION COUNTY.

All kinds of grain looking well, and a large yield is expected. Range grass continues good.

BEULAH, MALHEUR COUNTY.

May opened out nice and pleasant and gave us great hopes of an abundant hay crop and of fine garden, but alas, on the 28th, 29th and 30th we had a heavy frost, with a temperature of 26°, 27° and 29°, and when we walked with an overcoat on to the garden on the morning of the 28th and saw our bean, tomato, cabbage and watermelon vines all lying black on the ground, we took a long breath and sighed and wished for an August sun or another winter. But there is some consolation in the fact that the frost killed the pig weeds that had started in the gardens, and that, you know, is a help when a man has them to pull before breakfast. We are having a nice rain to-day, accompanied with enough hail to beat away everything that the frost did not kill. Our alfalfa crop is fine. Wild grass is good. Stock of all kinds are fat. This county will have a fine hay crop. Very little grain was sown in this county, and that sown is very backward, although this is a fine grain county.

JORDAN VALLEY, MALHEUR COUNTY.

Thunder was heard here on the 7th, 9th and 26th. From the 8th to the 11th a very heavy rain fell, amounting to 2.31 inches, which is very unusual for this locality. Its effect upon vegetation is very marked. Crops and grass on the hills look very promising, and the citizens as a consequence are jubilant over the outlook. The rounding is about completed here, and stockmen are complaining of losing heavily the past winter. In some localities the loss in horses ranged as low as 10 or 15 per cent., while in others close at hand it is said to have amounted to over 50 per cent. Some bands of sheep wintered without any loss to speak of, while others on the same range lost $33\frac{1}{3}$ per cent. This is said to lie in the management more than anything else.

HAPPY VALLEY, HARNEY COUNTY.

May has been dry and cool. Vegetation is 10 days or two weeks later than usual. Grass on the ranges is better than for a number of years. Frosts on the 28th and 29th did considerable damage to crops. Sheep shearing is nearly done, and the clip is very light; wild roses are in bloom at the close of the month.

OREGON CROP-WEATHER BULLETINS FOR MAY.

The following bulletins were issued from the central office during May, 1890. Coming as they do from almost every section of the State, the progress of the vegetation and crop prospects are well outlined, and will prove of value for future reference and comparison in years to come. Bulletins are issued on Saturday of each week, and are published in most every paper in the State. The bulletins complete are here reprinted, and will be each month, for general information and for reference in future seasons.

For Week Ending May 3, 1890.

WEATHER.

The temperature for the past week has been above the normal. Since January 1st it has averaged below the normal.

There was no rainfall during the week. From January 1st to date more than the average amount has fallen. From July 1, 1889, to date, about the average has fallen. The amount of sunshine has been above the average for the week. Almost cloudless weather has prevailed during the past seven days.

The nights have been much warmer and no frosts are reported. This is the second week of good growing weather this season, and all vegetation has shown the beneficial effects of the weather. While the low lands are generally moist, yet general rains would prove beneficial.

CEREALS.

Winter and spring-sown wheat is reported to be in excellent condition. "Prospects were never better at this season for a bountiful wheat crop," is reported from the various wheat districts. Early spring-sown grain is up; the late sown would be materially benefited by rain.

FRUIT.

The weather has been especially favorable to the fruit crop. The warmer nights and bright sunshine have done much towards advancing the fruit past its stage liable to be injured by frost. The peach and apple crop will be less than an average; other fruits and berries give promise of unusual yields. Many acres of new orchards will come into bearing this year.

GENERAL REMARKS.

In Washington county maple, alder and hazel are in leaf, one month later than last year; ground is in excellent condition. In Clackamas the ground is drying out; on the uplands of the Willamette valley especially is rain desired. In Benton, at the agricultural college, grasses are heading out, garden peas quite high, radishes and lettuce growing finely,

strawberries as large as a dime, apple trees in full bloom. Oak leaves have generally leafed out in Western Oregon. In Douglas county, in the neighborhood of Roseburg, peach crop generally killed by April frosts. In Jackson county grape vines budding out, one month later than last year.

In Eastern Oregon sheep shearing is in full sway; the clip is good and wool weighing well; plums and prunes in the interior sections in blossom; the grain prospect throughout this section was never better; spring grain is generally up.

CORRESPONDENTS' REMARKS.

St. Helens, Columbia county.—The week has been all that possibly could have been desired—warm, sunny, growing weather, 45° being the lowest temperature and 78° the highest; grass and garden stuff made wonderful growth.

Forest Grove, Washington county.—The weather has been most excellent for growing crops the past week: the maple, alder and hazel are fairly in leaf, being about a month late; the prospects for an excellent crop of cherries, plums and pears are good; apples promise a fair crop.

Beaverton.—Ground and weather and roads are all that could be desired; farm and garden work is now under full headway and everybody is busy.

Oswego, Clackamas county.—Crops favorably affected; the last seven days have been warm and dry; the fruit crop is very little damaged by frost, and promises a large crop.

Butte Creek.—Ground is getting to dry too plow in some places, and a copious shower would do much good; the fall wheat in this section never presented a better prospect, and the spring crop is growing nicely; no rain has fallen during the past seven days.

Wilsonville.—Crops in good condition; farmers through seeding with some few exceptions on extreme wet land; crop has been put in in excellent condition; the hills are needing rain, while on low land a good shower would do no harm.

Salem, Marion county.—No rain during the past seven days; plowing and summer fallow stopped by the very warm weather; trees in full leaf and bloom; birds of all kinds in full numbers; China pheasants and grouse plentiful.

Mt. Angel.—The weather has been favorable to all crops; no rain during the week.

Turner.—The weather for the last seven days has been very dry; late sown grain is suffering for the want of rain; gardens and potatoes are also in great need of it; all kinds of fruit trees are now in full bloom; wild strawberry blossoms in great abundance; seeding has been stopped by the dry weather, and the grass is growing very slowly.

Crowley, Polk county.—General crops very favorably affected by the weather.

Eola.—General crops in good condition; rain would be beneficial, although, as yet, nothing has suffered for the lack of it. Fruit trees are in full bloom and the absence of late frosts will give an abundant crop.

Shedds, Linn county.—The weather for the past several days has been very dry: the ground is becoming quite dry, although, as yet, the crops are not suffering for rain. Spring seeding is progressing quite rapidly and will be completed in about one more week.

Scio.—Spring sown wheat is nearly done. The weather during the past seven days has been very warm and fall wheat has made a rapid growth. Spring sown grain needs a little rain. Fruit trees are in full bloom.

Corvallis, Benton county.—(Oregon Experiment Station.)—Wheat on upland is not suffering but shows a need of rain. Wheat on moist land, that was not too wet, is now doing better than upland wheat. Wheat planted in November and December by Station, on plats, is now growing nicely. Ten varieties of grasses are now heading out, most of which are in bloom. Garden peas are from 6 to 8 inches high; radishes are large enough to market; lettuce is from 8 to 10 inches across; early varieties of strawberries that lost their first crop by frost have bloomed again and now have berries the size of a dime; potatoes are up; apple trees are nearly all in full bloom; cherries have nearly all dropped their blooms; pears are still blooming; grape vines only 13 months old now show signs of from 10 to 36 bunches of grapes per vine. On the 27th of April the great fly catcher was first observed.

Philomath.—Crops in good condition. April 26th, 27th and 28th clear, balance of the week cloudy of a morning and with sunshine rest of the day; apple trees in full bloom; the first bloom of cherry and other trees were injured during the fore part of April; some report light bloom on apple and plum trees.

Monroe.—No rain this week and all farming is suspended; there will be a light acreage; fruit seems to be fine thus far; apples are in full bloom.

Toledo.—No rain during the week: all crops very favorably affected by the weather.

Wells.—Growing crops looking well; the past seven days have been warm and pleasant; apple trees were in full blossom on the 27th; first appearance of codlin moth on the 1st; oak trees are all leafed out.

Roseburg, Douglas county.—Rainfall below the average; temperature above, with very much sunshine; fruit and grain crop favorably affected by the weather; no rain in the past seven days.

Olalla.—No rain this week; the peach crop at Roseburg and along the river as far as Winston's (six miles) has been killed by the frosts, but in this section all kinds of fruit are growing nicely; wheat and oats are in splendid condition.

Gardiner.—Crops very favorably affected by the weather.

Jacksonville, Jackson county.—The weather favorable to all crops; apple and pear trees are now in full bloom and indications are that there will be plenty of fruit in some localities; grape vines are now budding out fast; they are nearly one month later than last year.

The Dalles, Wasco county.—Weather continues favorable for crops and vegetation; fruit trees have all shed their blossoms; cherries are as large as large peas; crops looking fine throughout the country.

The Dalles.—All kinds of grain look fine; fruit trees in bloom.

Boyd.—The weather favorable to different crops; it has been uniformly warm; fruit trees are in bloom and the danger from frost is lessened.

Mosier.—General crops very favorably affected by the weather; cherry and plum crops light.

Grass Valley.—The past week has been fine for growing crops, grass, gardens, etc. The warm weather is just what was needed. Shearing is in full blast and wool is weighing well.

Monkland.—The temperature for the past seven days has been above the normal, the highest being 80° and the lowest 40°. Grain is growing well; all kinds of trees are leafing; poplar and locusts are in bloom.

Erskinville, Sherman county.—Weather very favorable to crops; 25th, 26th, 27th and 28th very pleasant, with sunshine; 29th partly cloudy and warm; 30th partly cloudy and cool; May 1st cloudy; no rain in the past seven days; plums and prunes in bloom.

Demoss Springs.—The farmers of Sherman county never had a better prospect for grain than the present year; spring-sown grain all up; farmers still plowing; summer fallow too dry for sod plowing.

Mayville, Gilliam county.—The past seven days have been very warm; no rain, but we are needing a shower badly, as the top of the ground is getting dry. Grass and grain are growing very fast; stock looking well; fruit trees in leaf.

Fossil.—No rain since the 21st. The last three nights have been warm, which has made the grain grow very fast, but both grain and grass need rain.

Hardman, Morrow county.—Growing crops favorably affected by the weather; everything is growing rapidly; sprinkled on the 29th and 30th; mean temperature, 60.3.

Alpine.—Weather very favorable to growing crops; five days have been clear and two fair; the week has been warm like spring; solar halos on 21st from 10 A. M. till 2 P. M., also on 24th from 1 P. M. till 4 P. M.; there have been light dews every night during the week.

Eight Mile.—General crops in fine condition; the past week has been warm and has made all vegetation boom; ground baked considerably in places; gooseberries in bloom.

Helix, Umatilla county.—Growing crops looking very well; all vegetation has made a good growth the last week; we need a shower, although there is nothing suffering for rain; cherry and apple trees in bloom.

Weston.—A slight trace of rain on the 29th, not enough to do any good; late spring-sown grain needs rain to bring it above ground; fall-sown growing very well, but rain would help out; some grain an inch high; temperature from 50° to 84°.



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TABLE

Miscellaneous Meteorological Data of the Oregon State

District, Station and County.	Elevation above mean tide level.	Atmospheric Pressure.					Temperature of the air (in degrees and tenths, Fahrenheit's scale.)													Precipitation (plus or minus).
		Mean reduced barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Monthly mean.	Departure (plus or minus) from the average.	Maximum.	Date.	Minimum.	Date.	Range.	Mean maximum.	Mean minimum.	Mean of Max. and Min.	No. of times temp'ture reached			
																	90° or above.	40° or below.		
COAST—																				
Fort Canby, Washington	179	30.066	30.456	12	29.691	10	54.0	—	73	18	44	9	29	59.4	48.6	—	0	0	1	—
Astoria, Clatsop county	38	—	—	—	—	—	57.1	- 4.3	76	4	40	9	36	64.9	49.3	—	0	1	1	—
Tillamook, Tillamook county	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toledo, Benton county	30	—	—	—	—	—	57.2	—	87	24	35	27	52	70.2	44.3	—	0	4	0	—
Gardiner, Douglas county	12	—	—	—	—	—	56.8	- 4.0	82	23	42	27	40	64.7	48.8	—	0	0	0	—
Bandon, Coos county	55	—	—	—	—	—	58.2	- 5.9	72	2	44	31	28	62.9	53.5	—	0	0	0	—
Ellensburg, Curry county	60	—	—	—	—	—	55.4	—	83	25	43	22, 30, 31	40	61.8	49.0	—	0	0	1	—
WILLAMETTE VALLEY—																				
Vancouver Barracks, Wash.	68	—	—	—	—	—	59.2	- 0.8	85	3, 4, 5, 26	36	29	49	73.1	45.3	—	0	7	1	—
St. Helens, Columbia county	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vernonia, Columbia county	—	—	—	—	—	—	55.8	—	88	4	39	22	49	—	—	—	0	1	1	—
Portland, Multnomah county	80	30.030	30.430	13	29.615	10	60.6	- 3.7	87	5	40	9	47	72.5	48.8	—	0	1	1	—
East Portland, Multnomah county	75	—	—	—	—	—	60.7	- 1.5	84	26	44	9, 10	40	69.8	51.6	—	0	0	0	—
*Forest Grove, Washington county	229	29.790	30.190	13	29.390	10	59.7	—	89	5	36	30	59	74.3	45.1	—	0	5	0	—
McMinnville, Yamhill county	180	—	—	—	—	—	58.7	—	89	5	37	28	52	73.7	43.7	—	0	5	0	—
Hubbard, Marion county	270	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mount Angel, Marion county	140	—	—	—	—	—	59.6	- 3.5	86	5	26	9	50	71.8	47.3	—	0	3	0	—
Eola, Polk county	500	—	—	—	—	—	57.4	- 2.9	84	5, 26	38	30	46	69.1	45.6	—	0	0	0	—
*Corvallis, Benton county	150	29.720	30.080	13	29.339	10	58.7	—	84	14, 24, 25	34	30	50	71.5	45.9	—	0	4	0	—
†Albany, Linn county	224	29.860	29.960	13	29.710	10	59.4	- 2.1	84	5, 15, 26	38	29, 30, 31	46	72.0	46.8	—	0	5	0	—
Creswell, Lane county	480	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
UMPQUA VALLEY—																				
Roseburg, Douglas county	523	30.049	30.410	13	29.775	26	59.3	- 3.8	86	25	38	9	48	71.8	46.8	—	0	4	1	—
ROGUE RIVER VALLEY—																				
Grant's Pass, Josephine county	964	—	—	—	—	—	61.4	- 2.4	98	25	34	11	64	77.6	45.1	—	3	8	0	—
Jacksonville, Jackson county	1640	—	—	—	—	—	60.0	- 1.3	88	25	35	11	53	73.4	46.5	—	0	5	1	—
Ashland, Jackson county	1940	—	—	—	—	—	58.2	- 1.4	88	25	36	30, 31	52	71.7	44.8	—	0	9	1	—
EASTERN OREGON—																				
Cascade Locks, Wasco county	125	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hood River, Wasco county	—	—	—	—	—	—	63.4	—	88	5, 15, 26	40	30	48	75.8	51.0	—	0	1	0	—
The Dalles, Wasco county	116	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grass Valley, Wasco county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dufur, Wasco county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lone Rock, Gilliam county	2000	—	—	—	—	—	55.2	—	82	26	28	28	54	69.2	41.3	—	0	12	0	—
†Heppner, Morrow county	1950	30.084	30.540	13	29.660	10	58.0	—	88	7	32	30	56	74.6	41.4	—	0	11	0	—
Alpine, Morrow county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ella, Morrow county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pendleton, Umatilla county	1122	—	—	—	—	—	60.1	—	91	6	30	30	61	75.0	45.2	—	1	6	1	—
Weston, Umatilla county	1800	—	—	—	—	—	59.0	—	88	6	34	29	54	71.2	46.9	—	0	4	0	—
Walla Walla, Washington	1018	29.970	30.440	13	29.510	7	63.0	- 0.7	90	6	40	30	50	74.7	51.2	—	1	1	1	—
Spokane Falls, Washington	1909	29.938	30.379	13	29.542	27	58.1	- 1.3	88	7	38	30	50	70.2	46.0	—	0	2	1	—
Joseph, Wallowa county	4400	—	—	—	—	—	52.9	—	83	7, 8	28	30	55	65.7	40.2	—	0	15	1	—
La Grande, Union county	2784	—	—	—	—	—	56.6	- 0.5	87	7	32	29	55	69.7	43.6	—	0	9	3	—
Summerville, Union county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Telocasset, Union county	3449	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
North Powder, Union county	3250	—	—	—	—	—	53.6	—	84	26	24	30	60	68.0	39.1	—	0	18	1	—
Baker City, Baker county	3440	29.934	30.364	13	29.547	7	54.6	—	85	6	27	30	58	68.4	40.8	—	0	15	1	—
Huntington, Baker county	2110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Boise City, Idaho Territory	2750	29.918	30.399	12	29.551	27	60.2	- 2.4	89	26	38	12	51	73.2	47.2	—	0	3	1	—
Beulah, Malheur county	4400	—	—	—	—	—	56.2	—	87	26	26	28	61	73.9	38.4	—	0	19	0	—
Jordan Valley, Malheur county	4450	—	—	—	—	—	54.2	—	85	26	26	28	59	70.9	37.4	—	0	22	2	—
Burns, Harney county	—	—	—	—	—	—	54.5	—	83	7	24	26, 27	59	69.4	39.6	—	0	14	0	—
Silver Lake, Lake county	4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diamond, Harney county	4200	—	—	—	—	—	55.6	—	87	26	29	28	58	70.7	40.6	—	0	16	0	—
Lakeview, Lake county	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

*Actual barograph readings.

† Actual aneroid barometer readings.

‡ Officers U. S. Signal Service.

Precipitation. Rain, melted snow, hail, fog, dew and frost, in inches and hundredths.					Winds. Velocities in miles.					Number of days				Number of						Names of Observers.		
Total precipitation.	Departure (plus or minus) from the average.	Total from July 1, 1889, to May 31, 1890, inclusive.	Av. from July 1, 1889, to May 31, 1890, inclusive.	Departure (plus or minus) from average.	Total depth of unmelted snowfall in inches.	Total movement in miles during the month.	Average hourly velocity for month.	Maximum velocity			Prevailing direction.	On which .01 inch or more rain fell.	Cloudy.	Partly cloudy.	Cloudless.	Hail storms.	Thunder storms.	Solar halos.	Lunar halos.		Light frosts.	Killing frosts.
								Miles per hour.	Direction from.	Date.												
1.00					0	7260	9.7	48	SE	19	N	12	16	10	5					0	0	John Grover.
1.00	-2.53	69.78	73.87	-4.09	0						W	8	8	13	10					0	0	John N. Griffin.
0.00					0						W	4				1						Dr. H. W. Vincent.
0.00		84.66			0							4										J. S. Gray.
0.00	-3.03	80.61	61.53	-19.08	0						NW	3	12	0	19					0	0	Geo. Bennett.
1.00												6	9	5	17							F. S. Moore.
1.00	-0.94	42.00	36.14	-5.86	0						NW	6										Hospital Corps, U. S. A.
1.00					0						NW	5	1	14	16	2	1			2		G. W. Dallas.
1.00	-1.39	46.56	48.71	-2.15	0	4070	5.5	24	SSW	6, 8	NW	9	5	11	15	1		2				B. S. Pague.
0.00	-0.51	31.27	32.56	-1.29	0							6				1		2			1	Dr. Geo. Wigg.
0.00					0	1563	1.6	25	S	5	N	6	13	10	8	1	2					Prof. G. W. Shaw, A.M.
0.00		50.50			0						SW	6	4	12	15							Capt. Wyatt Harris.
0.00	-1.80	42.43	46.65	-4.22	0						W	8	4	16	11	1	1					Dr. Urban Fisher,
0.00	-1.74	39.41	39.37	-0.04	0						N	3	8	10	13		2	1				O. S. B.
0.00					0	6554	8.8	33	W	15, 26	W	4	6	16	9		1					Thos. Pearce.
0.00	-2.42	48.76	46.63	-2.13	0						N	3	6	13	12		1	12				Or. Experiment Station
																						John Briggs.
1.00	-0.68	46.08	34.17		0	2802	3.8	24	N	24	NW	8	7	13	11					1		Thos. Gibson.
0.00		46.61			0						NW	3	18	2	11		2		1			Dr. J. G. Jessnp.
1.00		34.26			0						SW	6	6	11	14		2					Peter Britt.
1.00	-0.20	24.98	20.95	-4.03	0						NW	6	5	9	17		2	2				F. H. Carter.
0.00	-2.84	75.09	76.29	-1.20	0						W	7	7	11	13							U. S. Engineer Corps.
0.00		31.37			0						W	3	0	8	23							Dr. E. J. Thomas.
0.00	-1.38	10.85			0						SW	7	13	1	17	2	1	14			4	W. H. Colwell.
0.00		9.42			0						NW	7	7	13	11					3	3	Arthur Smith.
0.00					0						SW	3	9	5	17			4				E. H. Andrews.
1.00					0						SW	5	2	8	21	1					1	
0.00					0						SW	6	16	0	15						1	M. A. Baker.
1.00	-0.92	13.66	18.39	-4.73	0	5405	7.3	32	SW	27	SW	7	6	10	15							H. S. Blandford.
1.00	-0.41	18.51	19.68	-1.17	0	3935	5.3	26	SW	16	SW	9	14	7	10							Chas. Stewart.
1.00					0						NW	3	17	7	7							W. A. Leslie.
1.00	-1.03	16.58	18.09	-1.51	0	1141	1.5				SE	7	4	8	19						1	J. K. Romig.
1.00		13.77			0							7	10	9	12						1	Wm. C. Cusick.
1.00					0						SW	5	9	1	21					3	5	G. Venable.
1.00		11.48			0	4432	6.0	25	NW	27	NW	7	7	9	15						2	C. H. Stuller.
1.00	-0.52	14.61	13.33	-1.28	0	3719	5.0	28	SE	7	NW	6	5	12	14					2		Wm. A. Korts.
1.00		12.04			0							5	4	10	17					2	4	T. L. Arnold.
1.00		14.68			0						W	6					3				2	J. R. Blackaby.
1.00					0						N	2	14	1	15						2	W. R. Gradon.
					0						NW	4	7	2	22			1			4	J. H. Neal.

TABLE No.

PRECIPITATION TABLE: Total daily amount of precipitation, including rain, hail, sleet, melted snow, &c.
for month on right of total daily. The precipitation is recorded in inches and hundredths of an inch.
May, 1890. † indicates trace or sprinkle.

[illegible]

Rain, dew and frost, with total depths. For the month of															Number of days on which rain, snow, sleet, or hail fell, excluding fog, dew and frost —midnight to midnight.						
18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total for month.	Less than .01 of an inch.	.01 to .10	.11 to .25	.26 to .50	.51 to 1.00	Over one inch.	Total No. of days.
	.49				.04				.01	.05	.07		.19	1.76	1	6	4	2	0	0	13
	.60				.02			.03		.12	.21		.01	1.14	0	4	3	0	1	0	8
											†			.85	1	1	1	2	0	0	5
	.10													.88	0	3	0	0	1	0	4
											.04			.23	0	4	0	0	0	0	4
														1.01	0	1	4	1	0	0	6
	.20									.10		.30	.20	1.30	0	1	0	5	0	0	6
									.23	.07	.15	.31	.24	1.00	0	0	4	1	0	0	5
	.14									.33	.22	.04	.21	1.08	1	5	3	1	0	0	10
	.06									.08	.06		.03	.32	0	6	0	0	0	0	6
	.02									.01	†	.03	.18	.31	1	5	1	0	0	0	7
	.17									†	.21	.15	.05	.64	3	3	3	0	0	0	9
	.28	.04									.08	.05	†	.59	1	7	0	1	0	0	9
	.03									†	.04	.19	†	.26	5	2	1	0	0	0	8
	.24										.03	†	.02	.39	1	4	1	0	0	0	6
	.22									†	.02		†	.29	4	3	1	0	0	0	8
											.08			.03	1	5	1	2	0	0	9
													.06	.35	1	2	1	0	0	0	4
														.10	0	2	1	2	1	0	6
	†													.12	1	4	1	0	0	0	7

TABLE No. 2-Con

PRECIPITATION TABLE: Total daily amount of precipitation, including rain, hail, sleet, melted snow, fog, dew, and frost, for month on right of total daily. The precipitation is recorded in inches and hundredths of an inch. May, 1890. † indicates trace or sprinkle.

District and Station.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
LAKE REGION.																	
Paisley _____																	
Silver Lake _____																	
UPPER COLUMBIA RIVER BASIN AND EASTERN OREGON—																	
Cascade Locks _____								.24	.02		.04	.03					
Hood River _____											.10						
The Dalles _____																	
Dufur _____																	
Grass Valley _____																	
Prineville _____																	
Crater _____																	
Waseo City _____																	
Arlington _____																	
Lone Rock _____	†					†	†	.07		.16	.07						
Heppner _____	.09						.05	.20		.17	.15						
Alpine _____								.37			.13						
Canyon City _____																	
Hardin _____																	
Burns _____		†								.40							
Diamond _____							.06	.11	.30	.05							
Nolin _____																	
Pendleton _____																	
Weston _____							.05	.04		.05	.02						
Walla Walla, Wash. _____								.17	.02	.02	.84						
Spokane Falls, Wash. _____								†	.87	.03	.44	.03		.04	.01		
Joseph _____	.45						†	.52			.65	†					
La Grande _____							.34	.22		1.33	.28	.01					
Telocasset _____							.07	.62		.10	.34						
North Powder _____																	
Baker City _____	.02						†	.28	.13	.18	.46						
Huntington _____																	
Boise City _____	†	.16				.20	.21	.22	.16	.27	.62		†				
Vale _____																	
Westfall _____																	
Beulah _____								.30		.03	.04	.02					
Jordan Valley _____								1.37	.30	.64							

and frost, with total For the month of	Number of days on which rain, snow, sleet or hail fell, excluding fog, dew and frost —midnight to midnight.
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[illegible]

Pleasant View.—Wheat looks well.

Baker City, Baker county.—Rainfall below the average; temperature above, with average amount of sunshine: .02 inches of rain on one day during the week. Powder river nearly overflowing; reported very high in mountains near source: caused by warmth and melting snow in mountains: all crops and gardens growing nicely: prospects for a good yield were never better.

Prairie City, Grant county.—The past seven days have been very favorable to all the growing crops, with almost continued sunshine. We had two slight frosts on the nights of the 21st and 22d: fruit trees coming into bloom.

Canyon City, Grant county.—No rain the past week: there will be little grain raised without irrigation (unless we have a heavy rain) throughout this county. Peaches, cherries, plums and prunes are very nearly all winter-killed. There will be a very few that will yield, and these are standing in sheltered places.

Prineville, Crook county.—No rain during the week; weather warm: mercury 86° on Monday and Tuesday; high winds from west on Wednesday: crops growing fine: no frost for a week.

Ellensburg, Curry county.—All growing crops very favorably affected by the weather.

For the Week Ending May 10, 1890.

WEATHER.

The high temperature of the previous two weeks continued up to Wednesday of this week, when it fell, being more near to the normal: the temperature fell to near the frost point, but owing to the cloudy weather no frosts are reported to have occurred.

During the week rainfall in all sections of the State was quite copious except in the Willamette valley. Nearly 2 inches fell in Jackson county, an inch in Douglas and Josephine, generally less than $\frac{1}{2}$ of an inch in the Willamette valley, and in Eastern Oregon from .10 to nearly .75 of an inch. Rain has been needed and more would prove beneficial. Present indications are for more rain. The amount of sunshine has been about the average: thunder storms were experienced in Southern and Eastern Oregon on the 2d, 3d, 4th, 5th, 6th and 7th insts.

CROPS.

The weather conditions have been very beneficial to crops of all kinds. Spring-sown wheat especially needed rain, and in those districts where it was most needed it fell. Unusual as it may appear, in the Willamette valley the soil is very dry and in sections hard. While all crops are growing, yet good general rain would prove to be very beneficial. The sub-soil is generally very moist as yet, but small seeds, spring-sown grain and the like need surface moisture. The cooler, cloudy weather that has prevailed the past few days has proven very beneficial.

Grasses are heading out in sections; alfalfa has a good stand. The grass is generally reported to be in good condition.

"Crops are all growing finely and rain is needed," is reported from all sections. On the 8th general rain prevailed in Eastern Oregon, which will tend to lessen the possible injurious effect of the warm, dry weather.

RIVERS.

The warm weather has rapidly melted the snows in the mountains: all streams in Oregon are rising, but no danger is apprehended. The Willamette river at Portland has risen six feet during the week and the current is swift. The Powder, Grande Ronde, Umatilla, Umpqua and Rogue rivers are rising. The Columbia has risen and is now on a slow steady rise.

CORRESPONDENTS' REMARKS.

Astoria, Clatsop county.—The rainfall has been below the average: .12 of an inch fell during the past week. Temperature about average. Pleasant, good weather for all growing crops. The rainfall during the week did much good to vegetation.

St. Helens, Columbia county.—Fine growing weather: everything looks well; rain, while not being badly needed, would be of great benefit; grass crop in fine condition.

Vernonia.—Weather very favorable to all growing crops.

East Portland, Multnomah county.—Young cherries are larger than peas. With the present weather it will be but a few days till ripe cherries are in the market.

Forest Grove, Washington county.—Rain is needed, but crops are not suffering. Soil that has been well cultivated holds plenty of moisture. All vegetables show a rapid growth; oaks are in full leaf.

Union Mills, Clackamas county.—Seeding nearly completed; the ground is very hard and dry: there have been several light showers, but not enough to soften up the ground. Fruit promises well: fall wheat looks fine: forest leaves in full bloom.

Salem, Marion county.—Crops not unfavorably affected by the dry weather. The last three weeks have dried the ground very much: have stopped plowing in the highlands: rain much needed: sheep shearing is being done: fleece good.

Mt. Angel College.—All crops in good condition, but in many places rain will be soon needed: fruit trees promising to bear abundantly this year.

Turner.—Crops look well: rain needed very much. Everything is growing: ground hard and dry.

Eola, Polk county.—The first four days the temperature was a little above the average, but during the last few days it has been quite cool and cloudy, with slight trace of rain on the 6th, 7th and 8th. I think there has been some rain around us, which has not reached here yet. It is still cloudy, with southwest wind: barometer, 29.30: temperature to-

day, maximum, 58°; minimum, 46°; mean, 52°. The clouds and southwest winds still look like rain, which is very desirable. Grain and grass are growing very satisfactorily; the gardens, however, need rain, and the grain and grass would also be benefited by it; there is a base moisture in the ground, but the surface is getting rather dry, so much so that small seeds, such as parsnips, carrots and the like do not germinate quite satisfactorily. If the temperature continues low we may expect rain soon.

Crowley.—The dry weather of the past week has affected the late crop somewhat injuriously; clear and warm all week, except yesterday and to-day, when it became slightly cool, with some clouds.

Corvallis, Benton county.—(Oregon Experiment Station.)—Rainfall, .01 of an inch: wheat crops are looking fine; little or no traces can be found of the injurious effects of the long rains: wheat on experimental plats is growing finely, and shows characteristic differences due to varieties and modes of planting. Experiment department has been planting Irish potatoes, corn and cow peas: the latter is the same as is highly praised throughout the South for hay and for redeeming worn-out soils. Several varieties of grasses on plats have headed out this week. Only a few more are to head out. Italian clover and sainfoin are in bloom. Bermuda grass, a Southern variety, which has appeared to be dead up to this week, is putting out vigorously. Lespedeza, another Southern grass, which bloomed but little last season, shows by the small plants coming up the maturity of a few seeds. The horticultural department has planted Lima, wax and other varieties of beans, seventeen varieties of garden peas and cucumbers this week. Some Lima beans are up. Red bud trees have bloomed this week. About two-thirds of the apple trees have bloomed this year, and have now dropped their blooms and show a fine prospect for a crop. Pear trees are full of fruit; gooseberries are bearing heavily; strawberries are still loading themselves with fruit.

Monroe.—All trees are in full bloom. Strawberries ripe on foothills. Grain all sown and last week grew very fast. Last five days cloudy and very light showers.

Wells.—The past seven days have been dry and warm, and grain begins to show the want of rain.

Philomath.—The 2d, 3d, 4th and part of the 5th was warm with considerable wind. The 4th and 5th grain and grass did not grow, as there appeared to be no moisture in the atmosphere. The past 3 days have been cloudy, with occasionally a slight mist, which is very favorable to all growing crops.

Toledo.—Weather favorable to crops; .42 of an inch of rain during the week.

Scio, Linn county.—Spring sowing is done and a much needed rain is beginning to fall. The prospects for abundant crops were never better than now. Fruit promises an abundant yield.

Albany.—It has been a dull, cool week, with threatening rain, of which little fell. A light shower

one night. Rain is very much needed. Grass and grain injuriously affected by the weather.

Shedd.—The weather still continues very dry; no rain to speak of since last report. Fall grain still looks well, but needs rain. Late sown spring grain needs rain to bring it up.

Isabel, Lane county.—Four cloudy days during the week, with a few sprinkles of rain: April was a dry month, and thus far in May there has been no rain; ground so dry we cannot plow our gardens; mesquit hay crop injured by the dry weather; wheat and oat crop in good condition.

Roseburg, Douglas county.—The rainfall, .85 inch, was above the average; temperature also above; all crops very favorably affected by the weather; strawberries from local gardens are being shipped; a continuation of warm weather will ripen them rapidly.

Jacksonville, Jackson county.—May 5th there was a fine thunder shower here; it rained quite hard for a while and .49 inch fell in a short time, including a little hail, which did no harm: on the 6th we had another thunder shower, and it rained .51 inch; on the 7th it rained a little nearly all forenoon; .29 of an inch fell; the temperature during the storm was from 60° to 70°; the rain was much needed, as the ground was hard and dry on top, and some crops had begun to suffer; total rainfall for the season is 32.58 inches, against 12.50 inches in 1889; all crops in good condition.

EASTERN OREGON.

The Dalles, Wasco county.—The weather for the past week has been very changeable; calm on the 4th; temperature raised to 87° on the 6th; windy on the 7th; on the 8th very windy and cold; temperature went down to 41°; crops seem to be doing well, although the ground is dry in places; farmers are asking for rain.

Monkland.—The weather for the past seven days has been fine. Crops are growing fine; thermometer going up on the 5th to 88°; fruit trees are all right except peach trees; on the afternoon of the 5th there were strong signs of rain, but it blew over.

Boyd.—Various crops favorably affected by the weather. For twelve days preceding yesterday the weather was steadily warm day and night; ground is rapidly drying out, too much for summer fallowing.

Demoss Springs, Sherman county.—A sprinkle of rain during the week; crops have not as yet suffered; it is, however, too dry to plow; 1st, warm; 2d, 3d, 4th and 5th, north wind and very warm; 6th, wind changed and it was cooler; 7th and 8th, high wind in west; 7th, a sprinkle of rain.

Erskineville.—East wind 4th, 5th and 6th; very drying; still the crops are growing well.

Fossil, Gilliam county.—It has been very warm for the past seven days, which has been very injurious to some of the crops, especially in some localities.

Lone Rock.—The temperature has been above the average for the week; the maximum has averaged 76° and minimum 53°; .07 of an inch of rain fell

on the 6th: in some sections more fell, accompanied by hail: prospects are good for big yields in all crops except plums.

Heppner, Morrow county.—The dry weather was injurious to the crops, but the rain of the past twenty-four hours has done great good: unlike other Mays, we have been blessed with a beautiful shower, which has put thousands into the pockets of our farmers and fruit growers.

Hardman.—Everything bids fair for good crops. The 6th and 7th threatening rain: mean temperature, 64°.

Alpine.—Growing crops looking well: had a little thunder shower here on the 29th: it did not rain here, only sprinkled: continued to thunder about 2 P. M. and kept it up till 4 P. M.: lightning all evening.

Pendleton, Umatilla county.—Grain, though backward, is growing nicely, and will probably continue so for two weeks yet without rain; ground is getting dry for plowing, and there is yet a great deal to do. More rain is needed throughout the county.

Helix.—The weather has been very warm and dry, but crops are growing nicely: the ground is dry for plowing.

Weston.—The past dry weather has affected the wheat crop injuriously: rain is now falling: it was much needed: about one-half of an inch fell last night and to-day.

Walla Walla.—Rainfall, .17 of an inch on one day, is below the average for the week: temperature about the average: there has been very much sunshine the past seven days. Crops favorably affected by the weather; raining when this report is mailed.

Baker City, Baker county.—The rainfall of the past seven days was .41 inch: it fell on two days; this is about the average: the temperature also was about the average: spring seeding is about completed: prospects for exceedingly good crops were never better.

Canyon City, Grant county.—Grass and grain crops in good condition: the thermometer has ranged over 80° part of the time; there have been showers in some portions of the valley, but none near here; one or two waterspouts, doing some damage to grain crops: snowballs and other flowers are appearing in profusion.

Prairie City.—The past seven days have had almost continuous sunshine, and it has affected the growing crops very favorably: fruit trees are all in bloom, with prospect for a good stand; spring grain looking well.

Jordan Valley, Malheur county.—Grain almost all in: prospects favorable for a fine crop; acreage above the average; thunder shower on 2d: amount of rain, .14 of an inch.

For the Week Ending May 17, 1890.

WEATHER.

The temperature rose again in fore part of week and fell in latter part. Temperatures of from 80°

to 85° occurred in all parts of the State. For the week it has been above the normal. Frosts occurred in sections of Wasco, Sherman, Gilliam, Morrow, Crook, Grant, Harney, Malheur, Lake and Klamath counties on the 8th, 9th and 10th, doing damage to vegetation and tender plants. Rain fell in the wheat districts of Eastern Oregon, in Southern Oregon and along the coast on the 7th and 10th, doing great good to all vegetation, except in sections of Wasco, Sherman and Western Gilliam counties, where, as in the Willamette valley, the rain was very light. In these latter sections rain is badly needed. The mornings have been more cool and cloudy, and these features have helped crops along.

GROWING VEGETATION, ETC.

Fall and early spring-sown wheat growing finely. Late spring wheat will not germinate properly without more rain. Oats, barley, rye and corn are doing very well. Vegetables are becoming very plentiful, but for all rain is needed, especially in the Willamette valley. Fruit prospects continue good. Grass is growing nicely: the peach crop is the only one that is now sure to be short. If the codlin moth is controlled, the apple and pear crop will be good. From most every correspondent comes the desire for rain. In Washington county everything is growing rapidly. Cut worms are injuring the onion crop. In Clackamas county cherries and peaches promise large yields. In Yamhill the wheat crop will be good without more rain, and fruit will be abundant. In Marion the dry weather is injuring the crops. Fruit will be plentiful in Polk: wheat is doing fairly well. Hop crop will be an average one. In Linn fall wheat looks fine, spring wheat is uncertain. Fruit plentiful except peaches; gardens doing well. In Benton wheat on loose, moderately well-drained soil is growing well. On low undrained land wheat has made but little growth and needs rain. In Lane some rain fell on the 10th, which was very beneficial, grass growing rapidly and crops fine. In Douglas rain of past 10 days has been very beneficial: crops are very promising. In Jackson farmers are preparing to mow alfalfa: fruit has escaped frosts and danger from them is now past: all crops promising. In Wasco more rain is badly needed, but crops are promising; grass good: rain on 10th moistened the soil two inches deep. In Sherman and Gilliam the crops are doing well and stock is fattening up. In Morrow prospects were never better for crops: thunder on 7th: rain was very beneficial. In Umatilla and Union the rain was very beneficial: crops growing finely with excellent prospects: fruit plentiful. In Crook, Grant and interior counties rain fell last week; frosts did some damage: hay and grain crops flattering and fruit will be very plentiful.

FROM CORRESPONDENTS, EXCHANGES, ETC.

Astoria, Clatsop county.—Rainfall for the past seven days, .03 inch, which is below the average. The temperature was above the normal: splendid growing weather.

Vernonia, Columbia county.—Everything is being checked in growth now for want of rain: wheat and oats will not come up well unless we have it soon.

St. Helens.—Rain is not needed badly, but would do good: nights warm: mornings cloudy: grass and clover have made wonderful growth: even if no more rain falls there will be more than an average hay crop.

Forest Grove, Washington county.—Gardens and late-sown grain need rain: winter wheat looks well: grass and all vegetables are growing rapidly.

Beaverton.—Rain is needed: cut worms are injuring the onion crop: meadows look well: hay, potatoes and onions are the principal crops in this locality.

Wilsonville, Clackamas county.—Rain is needed badly on the hills; unplowed ground is becoming very hard and firm: spring grain is injuriously affected by the weather: fruit crop promises to be very abundant, especially cherries and peaches; this morning promises a shower, which will be hailed with joy: thermometer reached 84° one day in past week.

Union Mills.—Weather too dry to germinate late-sown grain, which lays in the ground unsprouted: a day and night's rain now would do immense good: fruits all look well: ground too dry to plow.

Butte Creek.—Crops of all kinds are in great need of a copious shower, and the dry weather will undoubtedly cut the hay crop short and injure the grain crop: no rain during the past 7 days: Wilsonville crops are suffering for rain: the showers on the 10th, 11th and 12th did but little good: a slight frost on the 9th, no damage done. Unless rain comes before another week, the damage to spring wheat crops will be very great.

McMinnville, Yamhill county.—Inquiry among the representative farmers from various parts of the country warrants the following statement concerning crops: Fall wheat is the principal crop this year, and will be a good crop without more rain: spring wheat and oats need rain: fruit of all kinds is abundant: apples, pears, cherries, plums, prunes and small fruits are reported plentiful everywhere.

Salem, Marion county.—Not full crop of fruit: the continued dry, hot weather injuriously affecting all kinds of spring-sown grain and all kinds of seed planted.

Mt. Angel College.—The smoke is coming again from the northwest and obscures the horizon. Prune and plum trees bearing richly, also peaches: weather very favorable for the vines (grape), that seem almost to sprout and leaf visibly. All crops favorably affected by the weather.

Turner.—Rain is very much needed, especially on hill land. There has been rain in the foothills and mountains, but none to speak of in the valley. Everything is growing, but crops will be very short if rain does not fall within the next two weeks.

Eola, Polk county.—There has been no rain here for the week, only a very slight trace on the 10th

and 11th. There has evidently been showers at a distance around us, but not a drop has reached us; we are still hoping and trusting it will soon come. The fall wheat is doing fairly well, but would be much benefited by rain. Everything else needs it badly. Fortunately during the dry spell it has not been excessively warm, and a condition of considerable cloudiness has prevailed most of the time, which has been favorable under the lack of moisture. Small garden seeds still fail to come up: should showers come soon probably they will come all right. Highest temperature for the week, 82° on the 14th; lowest, 39° on the 11th; mean, 67°.6.

Crowley.—No rain: crops somewhat injured. Little cloudy and warm to-day, which denotes rain.

Independence.—Hop men are all quite busy since the 1st inst. preparing the yards for the season of 1890. There is considerable work clearing the ground and making ready for the new crop. The poles have all to be reset, and this is the work that takes the time of the hop man. There will be about the same acreage this year as last, judging by the opinions of a number of growers who have been interviewed on the subject. The last year price was not so high as to encourage the planting of many new acres, although the outlook for a firm market next fall is good.

Dallas.—The crop prospect is most encouraging in all branches of agriculture. The fall grain is in excellent condition: the ground was in fine order for the reception of spring crops, and these were sown in the best possible shape and are responding to the spring sunshine with the best of promise. Fruit trees are also budding forth in vigorous style and the expectation is for a clean and healthy crop.

Albany, Linn county.—Spring crop injuriously affected by the weather. From reports secured fall grain is looking pretty well, but spring-sown grain needs rain badly. Fall wheat looks fine, but spring wheat is an uncertain quantity. Farmers harrowing where the dust is so thick one could hardly see the outfit. Farmers who were prompt, though, got their spring wheat in on time. Some of it has failed to appear: but it is looked for during the month. Apple, pear, cherry and prune trees are all right and promise a bountiful harvest; peach trees, though, were considerably injured and we will probably have to buy Southern Oregon and California peaches.

Shedds.—The dry, warm weather of the past few weeks still continues. Ground is getting very dry and crops of all kind need rain badly. Unless showers come soon the damage to crops will be very great.

Scio.—The warm weather of the past 7 days has given the spring-sown grain a good start, but rain is now needed to continue that growth; orchards and gardens are doing well.

Corvallis, Benton county (Oregon Experiment Station).—Wheat on college plats planted in December, November and March is looking well and growing nicely. On the field plats it is growing well

except where it was overflowed. Wheat on summer fallowed soil, which has been loose and moderately well drained, is growing well: but wheat on low lands undrained, where the disappearance of water was by evaporation, on such land there is need of rain, and the wheat has made but little growth during the past week.

The experimental department has planted over 500 varieties of potatoes this week: field corn is coming up; grasses planted in April would be benefited by rain, though they do not appear to be suffering; flea beetles are at work on the potatoes.

The horticultural department has been planting this week beans, parsley, pepper, anise, sage, sweet basil, corn salad, salsafy, okra, carrots and squashes. Lettuce of the varieties of "Boston Curled" and "Prize Head" are now heading: garden peas are in bloom. Since the capture of a few codlin moths some days since two spraying machines have been manned and kept running, one using Paris green and the other London purple. Tomatoes have been transplanted out in the open ground: wild strawberries are ripening.

Monroe.—Growing crops injuriously affected by the weather: they need rain badly: gardens are poor.

Wells.—The past 7 days have been very warm: grain of all kinds and gardens are badly in need of rain; growing crops injured.

Philomath.—Some fall grain looks fine, while others facing south need rain very much. Early spring grain does not appear suffering, but the late sown is much in need of rain, and that last sown will not come up unless it rains; orchard grass heading; late gardens are coming up uneven: early lettuce, fall-sown, eight to twelve inch heads: spring-sown in market: early cabbage, sixteen to eighteen inches across, six inches high, heading: apples and plums, fruit large enough to spray: radishes for market.

Cottage Grove, Lane county.—A good shower visited this section on the 5th, which was very favorably accepted, as it will make the late sown grain and the gardens grow faster. The grass is growing very fast and loose stock are mending. The trees and shrubbery are enshrouded with a beautiful new green summer coat of foliage. Crops are growing finely, and in fact everything looks more favorable for a prosperous year, even if it is a very late spring.

Siuslaw.—Hay and cereal crop very favorably affected by the weather.

Roseburg, Douglas county.—Rainfall for the past seven days, .15 inch, which is below the average; temperature is above the average: general crops in good condition.

Glendale.—Quite a heavy thunder shower passed over this valley May 6th, which was most pleasant after the depressingly warm weather of last week.

Gardiner.—All kinds of crops are growing well: rain, May 8th, .58; May 9th, .10; May 12, .10.

Olalla.—Vegetation of all kinds never in a more flourishing condition; abundant crops are expected

in field and garden: with the exception of peaches, our fruit trees are loaded with healthy young fruit.

Jacksonville, Jackson county.—We have had no frost as yet in May, and the danger is now past: farmers are preparing to mow alfalfa: crops in good condition.

Mosier, Wasco county.—The season is an unusual one: heavy winter rains packed the ground hard, and we have not had our usual amount of spring rain to soften the same, consequently cereals are forming for seed before attaining full growth.

Summit Ridge.—We had quite a rain here on the 10th, which wet the ground to a depth of two inches. The grain crop prospect is good with a few exceptions where the wire worms are at work.

Boyd.—There was frost enough on the night of the 8th inst. to kill tender vegetables on the highlands. Fall-sown grain promises well.

The Dalles.—The weather for the past week has not been so hot as the week before: windy and cooler every day: better weather for crops. On the 11th .20 of an inch of rain fell, which helped crops, but more is needed.

Erskinville, Sherman county.—Eighth, cloudy and windy: 9th, frosty; 10th, fair: 11th, rain: 12th, 13th and 14th, pleasant. It is getting dry, still crops are doing well.

Maysville, Gilliam county.—The past week has been quite warm. Grain is growing fast, but we are in need of rain; stock in good condition. The small grass is drying up, but the large bunch grass hasn't its growth yet.

Fossil.—Stock has fattened this week faster than usual. Some attribute this to the fact that the buffalo grass is taking the place of the bunch grass in places where the bunch grass has been overstocked or fed too close by sheep, and this buffalo grass matures earlier than the bunch grass, and has run up to seed some time ago. It is said to be a better early grass than the bunch grass, but it dries out sooner, and does not compare favorably with the bunch grass for a fall and winter grass. There has not been much rain, but the cloudy weather has caused the moisture to rise and the grain and grass has been much benefited.

Heppner, Morrow county.—Crop prospect good: .42 of an inch of rain on the 8th, 10th and 11th.

Eight Mile.—The weather during the past week has been very warm. Fruit trees are in full leaf. The ground is baked, which considerably injures the crops. A refreshing shower on the 8th followed by frosts on the 8th and 9th; but little damage done in this section. Although I have melons, corn and beans up they were not damaged much. The leaves of the Russian mulberry were bit and the more tender grape sprouts killed. We never had a better prospect for grain.

Hardman.—Heavy frosts on the 9th and 10th; sprinkled rain on the 10th and 11th. Spring grain looks well. Mean temperature, 52°.4.

Alpine.—The first three days of week were clear

last four cloudy. Rain, .37 of an inch on night of the 7th and morning of the 8th, and .13 of an inch on the afternoon and night of the 10th. Had hard thunder and lightning on evening of the 7th. The rain is doing much good to growing grain and gardens. A good many fruit trees are in bloom.

Weston, Umatilla county.—The fine rain which fell Wednesday and Saturday nights will be productive of great good to our growing crops, and also enable our farmers to finish their plowing. While the soil is wet below the surface, yet the warm weather and hot winds during the two weeks past were rapidly absorbing this moisture, and late spring-sown grain especially was beginning to suffer therefrom. But as matters now stand, the recent rainfall would not only relieve the crops, but also the minds of the farmers, for they were beginning to feel somewhat dispirited over the prospects.

Walla Walla, Wash.—Rainfall, .84 of an inch, which is above the average; temperature about the average; crops of every kind looking their best. Walla Walla strawberries are in market; splendid berries: far superior to those from California.

Estes, Umatilla county.—Monday, Tuesday and Wednesday of the past week were very hot, and injured wheat, oats and barley very much; but four days of rain since have perhaps overcome the damage.

Coos, Union county.—We have had a long spring drouth—some six weeks since any rainfall, until three days ago. For the past 48 hours there has been an immense amount of rainfall, and as the ground was so dry and parched, no one but an Eastern Oregonian can appreciate its true worth; the ground is thoroughly soaked. The out-range for stock was turning red and going to seed for want of rain, but now all is well. The fruit crop of our county is *non est*, except apples and sour cherries; plenty of berries, however. The outlook is good in this county for crops.

Prineville, Crook county.—Jack Frost, or some other kind of a frost, nipped all tender vegetables in Prineville on May 8th, which caused gardeners to "cuss" pretty loud. It was so severe that it killed cabbage plants.

The stock inspector has inspected the sheep in the northeastern part of the county, and finds that the loss of sheep in that part of the county out of a little over 100,000 head was 31,000.

Sheep men will soon commence moving their flocks to the mountains.

The layout for a large hay and grain crop in this county was never more flattering.

Canyon City, Grant county.—Excellent rains fell during the past week, doing much good and were well distributed throughout the valley. The Lombardy poplars and other shade trees are in full leaf. The mourning doves have arrived from the south; also numbers of swallows. Apple trees are in bloom, with a good prospect of an abundant crop; grass and grain crops in good condition.

Prairie City.—The past 7 days have been very favorable to all the crops in this section; rain fell on 2 days, well distributed and alternating with sunshine; so far fruit is all right, with prospects of a good crop.

For Week Ending May 24, 1890.

WEATHER.

Cooler and more cloudy weather has prevailed during the week, with a rising temperature on Friday and Saturday. Light frosts occurred in a few sections on the 21st, but no damage is reported from them. On the 19th light general rains prevailed throughout the State, varying from a sprinkle to .3 of an inch, which proved of benefit to all vegetation. From every section of the State save along the coast and in Douglas, Josephine and Jackson counties, come reports that more rain is needed, especially for late-sown spring grain, and, in sections, to allow of the proper heading out of the fall grain. Some fear that if rain does not fall by June 1 that an average crop will not be harvested.

CROPS.

Fall and early sown grain are beginning to head out; the stalk is generally reported to be very short. Rye is heading out and alfalfa is in bloom in Morrow county. Cut worms are injuring the onion crop and gardens in Washington and Clackamas counties. In the latter the hay crop on the hills will be short, and the late-sown grain did not germinate well, and much did not come up. Through the entire Willamette valley more rain is needed. The showers on the 19th proved to be of great good, but not enough rain fell. The acreage of grain in Benton is reported to be less than for years.

In Southern Oregon counties everything is promising, and large crops will be harvested. More rain would do no harm, though in most sections it is not yet badly needed. In these counties the winter rains were unusually heavy. The rain freshened up vegetation in Eastern Oregon, though more is needed. Encouraging reports as to the prospects come from the entire section. A good rain before June 1 would insure the largest crop ever gathered in this section. The weather has been too cool for corn to do well. Late-sown grain does not promise so well as winter and volunteer grain. In Gilliam buffalo grass is drying up. In Morrow potatoes and corn, as well as wheat, are promising. In Umatilla wheat is heading; nights have been cool. In Union, the valleys of Wallowa, Baker and interior counties crops are reported as growing well and giving promise of good yields. There has been but little rain and rather high temperature for the past five weeks.

The snow continues to melt in the mountains, but during the week the rivers have remained nearly stationary, or have fallen slightly.

CORRESPONDENTS' REMARKS.

Astoria, Clatsop county.—The rainfall for the last 7 days was below the average: the amount was .62 inch, which fell on one day. The temperature was also below the average: rain fell on the 19th and was badly needed. Cool, pleasant and good growing weather.

St. Helens, Columbia county.—The week has been cool, cloudy and moist: fine growing weather: grass is looking unusually well, promising an extra crop: river falling slowly.

Beaverton, Washington county.—The great want in this county is rain: the potato crop is likely to be light: the onion crop is suffering more and more from cut worms; frost at Beaverton on the morning of the 21st, but no damage reported.

Union Mills, Clackamas county.—A much needed rain fell on Monday, but still more is needed: indications point to more rain before long: hay crop on the hills will be short: grain on bottom lands looks well: cut worms are damaging gardens in this locality.

Wilsonville.—0.14 inch of rain on 19th, which helped the crops some: would want at least two inches to do the required amount of good: hay crop will be short: fruit of all kinds will be plentiful.

Butte Creek.—A copious shower of rain fell on the 19th inst., which was very refreshing to all vegetation: the fruit crop promises well: late sown grain did not germinate well, and much of it did not come up.

Oswego.—Slight showers during the first part of the week: not enough, however, to do much good: all crops need more rain: hay will be short.

Salem, Marion county.—Very dry and hot, and telling on late crops badly, also upon the fruit crop.

Turner.—The rain we have had has helped everything greatly, but more is needed very much: crops look well so far.

Mount Angel.—Rainfall below the average for the past 7 days: amount, .32 of an inch; this has been rather injurious to all crops: temperature about the average.

Eola, Polk county.—The ground is very dry: wheat and oats are showing great want of rain: fall wheat will begin to head in a few days, and unless we have rain very soon, the crops must be cut quite short: the greatest anxiety is everywhere expressed for rain soon: it is cloudy this evening, 22d, but both clouds and wind are coming from the northwest, a point from which we do not look for rain. Where the ground is well pulverized gardens are doing fairly well, but where it is not in good condition they are doing very poorly, many seeds failing to germinate. Maximum temperature for the week, 80° on 15th: minimum temperature for the week, 39° on 22d; mean for the week, 55°.

Crowley.—Spring grain has been injuriously affected by the lack of rain: there have been two cloudy days: a little rain on Monday, laying the dust.

Scio, Linn county.—The few light rains which have fallen during the week have been favorable to the growth of all kinds of crops. More rain, however, is needed to make good crops of the latest sown spring grain.

Corvallis, Benton county.—(Oregon Experiment Station).—Wheat crops of November and December planting are now heading out, some of which is rather low. Wheat of April planting has, since the little rainfall of the past week, assumed a better color, but has grown but little. On experiment farm, corn, horse beans and cow peas are growing finely. Young April planted grasses need rain. In fact, all crops would be benefited by rain. In horticultural department garden peas are suffering for rain. Many varieties of grasses on the permanent plats are needing rain. Spraying of fruit trees has again been renewed since the rain. Italian clover is in full bloom and is about three feet high.

Philomath P. O.—The cloudy weather has been favorable, but rain is badly needed. Some fall wheat looks well, but the majority is running up very spindling, and without rain will soon be past redemption for a good crop. Rain on the 19th at Corvallis, which extended three miles south on the State road. Timothy and other hay crops are very light, although a good rain would make plenty of hay.

Monroe.—Wild blackberries in bloom, with prospects of a large crop. Crops of all kinds need rain: fall wheat is heading out. Apple crop injured by insects. Acreage of grain in Benton county less than for years. Gardens are very poor. Young China pheasants plentiful.

Olalla, Douglas county.—Condition all kinds of of vegetation all that can be desired. The farmers think that in another week a little rain would not come amiss. Cool and cloudy on the 20th.

Roseburg.—No rain during past seven days, which is below the average; temperature above: ranchers complaining for rain: it is popularly said, however, that "rain never fails to come opportunely;" hence farmers and ranchmen are hopeful for the usual rain.

Jacksonville, Jackson county.—The first new peas were brought into town on the 21st, and new potatoes will soon be in the market; fruit and growing crops look well, and have not, as yet, suffered for want of moisture.

The Dalles, Wasco county.—Westerly winds have prevailed throughout the past week: 19th, 20th and 21st very windy and quite cold; good weather for crops: the market is now supplied with strawberries and green peas. The Dalles had a nice shower of rain on the 19th: most too cool for corn to do well: some of the farmers are crying for rain, but almost all kinds of grain look well, especially fall and volunteer.

Grass Valley.—The past week has been cool, with a very slight rain on the 19th. Since that time, however, grain has looked very much refreshed:

fall grain is beginning to grow finely: prospects for crops are good: a good rain will be needed soon.

Boyd.—The top of the ground is too dry for late-sown grain to come up well: fall-sown and early spring-sown grain looks well: the weather has been disagreeable since last Sunday.

Erskinville, Sherman county.—May 15th, 16th, 17th and 18th, fair and pleasant: 19th and 20th, sprinkled a little and very windy: 21st, fair: crops are growing, but would do better with rain.

Demoss Springs.—The crops need rain very much. Wheat crop in good condition: 17th, pleasant wind in west: 18th, wind in east: 19th, high wind in west and cloudy: 20th, high wind and cloudy: 21st and 22d, cool, threatening rain.

Mayville, Gilliam county.—The past week has been dry, with some wind from the north: had a slight sprinkle of rain on the 19th: frost on the 21st: don't think it did any damage: crops look well, but are still short for so late in the season.

Fossil.—No rain for the past seven days: the buffalo grass is drying up some: grain not suffering much yet.

Eight Mile, Morrow county.—The past week has been cooler than the week before: grain looks well, but spring-sown grain needs rain: if we get rain within a week or two the crop will undoubtedly be the largest this county ever produced.

Heppner.—Rainfall, .03 inch: this was below the average: temperature below the average: crops favorably affected by the weather.

Ella.—Grain crops fair, but need rain: bunch grass killed out in spots: stock in good condition: wells unusually full.

Alpine.—Five days have been clear and two fair: strong southwest wind on the 16th and afternoon of the 17th: solar halos on 14th from 8:30 A. M. till 2 P. M.: quite heavy dews on 12th, 13th and 14th: everything is growing nicely: rye is headed out: alfalfa is in bloom: gardens never looked better: prospect favorable for a bountiful harvest: crops are looking fine since the rain of the last week: wheat has grown astonishingly in the last eight days: potatoes and corn that were not up two weeks ago have nice tops and looking thrifty. If we get favorable weather and another rain by the 1st of June, we will have a good crop without a doubt.

Hardman.—Weather favorable for crops: cool through the day: nights cool: cool north winds for the past seven days: mean temperature, 57°.

Weston, Umatilla county.—Crops are doing well: a slight shower Monday: thermometer reached 39° during the week: nights are cool and the days are the same.

Walla Walla.—Rainfall below the average: amount in past seven days, .15 inch: temperature about the average: crops magnificent: wheat beginning to head: strawberries plentiful: the Walla Walla valley is a sight worth seeing now.

Pendleton.—The ground is in good condition, and unless very unfavorable conditions prevail, will have

a good crop: rain on the 19th did much good.

Summerville, Union county.—No rain to speak of in this section during the past seven days: some cloudy weather, but with only a sprinkle of rain: weather very favorable to grain crop: farmers are all done seeding, and crops generally never looked better than they do at the present time, and everything indicates that this will be the most prosperous season ever known in Grande Ronde valley.

Baker City, Baker county.—Rainfall for the past seven days, .12 inch, this amount being about the average: temperature also about the average: all crops very favorably affected by the weather.

Canyon City, Grant county.—The trees and shrubbery are now looking about at their best, and all nature is beautiful: the butterflies have made their appearance and the crickets begin to chirp: every prospect of a bountiful harvest: no rain during past week.

Prairie City.—The past seven days have been very favorable for the fruit crop, with almost continuous sunshine, but it has affected the range very injuriously: cause, no rain.

For Week Ending May 31, 1890.

WEATHER.

Sunday and Monday were warm and cloudless; the remainder of the week was cool and cloudy with rain, which fell quite copiously in the Willamette valley and showers elsewhere. Rain fell on the 28th, 29th, 30th and 31st in Western Oregon, and on the 30th and 31st in Eastern Oregon. On the 28th and 29th it was generally light. Owing to the correspondents having to mail their reports on Thursday, the rain is not generally reported. Next week's bulletin will evidently show the general effect of the rain. Cool windy weather prevailed in Eastern Oregon, with frost in sections, which did slight damage to tender vegetation.

CROPS.

The rain came at a most opportune time, and has greatly benefited everything. Rain two weeks ago would have insured a large spring crop, but as it is, usual conditions from now on will allow of a large crop to be harvested. In many sections late-sown spring grain did not germinate, and the present rain may yet produce a yield where none was expected.

Rain was badly needed up to the 28th, none of any consequence having fallen since April 20, and the temperature has been rather high. As a result the ground became hard, and there was not that growth which was desired.

In Grant county, on the 26th, temperature reached 93°, and grass on the hills is drying up. Killing frosts in Baker county on the 28th and 30th, and light frost in Union county, which did little damage on the 28th. Grain and other crops are very promising in the Grande Ronde valley. In Umatilla

county snow fell in the mountains on the 28th; wheat heading out and doing finely; in spots it is burnt slightly. Spring wheat is very promising. In Morrow wheat continues promising; more rain desired; considerable wind during the week. Rain is needed in Gilliam. Rye has made a good crop; wheat looks well, and rain will insure a fine yield; apples promising well; frost on the 28th did some damage; spring grain not doing well. In Wasco and Sherman winter wheat promising; cool weather very beneficial. Late-sown grain has not come up well; fruit is not doing well. In Jackson county alfalfa cutting began on the 26th; yield good. The continued warm weather unfavorably affected crops in Douglas county, but the present rain will produce a favorable change. Excellent crops are almost now certain throughout the Willamette valley. Fall wheat, where sown on summer fallow, is in fine condition, and in any event will produce a good crop. Where sown on stubble land it is not so good. The spring wheat has been an uncertain crop, but the present weather will allow of a fair crop to be harvested. Strawberries are cheap and plentiful. Cherries are nearly ripe. Vegetables are abundant. It seldom fails to rain at the proper time in Oregon, and the present rain was most opportune.

CORRESPONDENTS' REMARKS.

Astoria, Clatsop county.—Rainfall for the past seven days, .38 inch; this is below the average; temperature also below; rains on the 26th, 28th and 29th; crops very favorably affected by the weather.

Fort Canby, Wash.—0.17 inch of rain fell on four days of the past week; this was below the average; temperature about the average; no crops raised in this vicinity.

St. Helens, Columbia county.—This week's cloudy and showery weather has made great improvement in all growing crops; grass and garden crop in fine condition; rain fell on three days.

Forest Grove, Washington county.—We have had few very cool nights; little shower of rain yesterday; crops in general are suffering for rain.

Beaverton.—Rain on 28th and 29th, but much more is needed. On some gardens about one-half the onions are destroyed by cut worms, and on others one-third, and the vacancies are being re-seeded with carrots.

Union Mills, Clackamas county.—A good shower fell yesterday, doing great good to grain, grass and fruits; spring-sown oats will now germinate; fruits all promise well; fall wheat promises a good crop.

Butte Creek.—A copious shower of rain fell on the 29th, but not sufficient to warrant good crops; the grass crop will be very short, and late-sown grain has not all come up yet; a good rain would be very beneficial.

Central Point.—We need rain: the ground is getting very dry; the crops are beginning to suffer: the early-sown grain is doing fairly well yet, but the late sowing will be almost a failure unless we have rain within two weeks; fruit promises well so far.

Wilsonville.—Fore part of week exceedingly warm; 26th, thermometer stands 90°; last three days cold; 28th, slight sprinkle; 29th, showery; rainfall, .12 inch; despite the continued dry weather crops look fairly well; a very large acreage of potatoes have been planted.

Mount Angel College, Marion county.—Rain to the amount of .08 of an inch fell during the past seven days; early-sown wheat, etc., is in good condition; late-sown not so good on account of dryness; the late rain showers helped only superficially; much more rain is needed; grape vines and fruit trees very promising.

Salem.—More or less showery, which has done the crops much good; more rain, however, is needed very much; hay and oats are hurt by the past hot weather.

Turner.—Some rain during the past week, but more is needed; there are no indications for more; crops growing nicely.

Eola, Polk county.—There has evidently been some showers around us, but none have reached us except the little which fell to-day, the 29th. There have been indications of rain for the past three days, but the northwest sea breeze blows up of an evening and blows it back. The grain crop is suffering for rain. Should it come soon it will help grain generally very much, but it is too late now for even copious showers to give a full crop. The indications this evening favor rain, but the barometer is 29.30 and rising; that would be equal to nearly 30 in Salem. We still have strong hopes that rain will soon come. Maximum temperature for week, 84° on 26th; minimum temperature for week, 41° on 29th; mean temperature for week, 58°.3.

Crowley.—There has not been rain enough to lay the dust. Gardens not doing well; cold for the time of the year; growing crops favorably affected by the weather.

Siuslaw, Lane county.—Late crops, both wheat and oats, do not seem to grow much on account of continued dry weather; nights have been very cold with frost, doing a little damage to corn, beans, potatoes, etc. Fruit seems to be doing well, especially pears and plums, which crops are both very heavy this year.

Albany, Linn county.—The weather has not been of a growing kind this week. It has been quite cool during the past four or five days, threatening rain, but not giving it. A rain storm went along the Cascade range yesterday afternoon from south to north. Everything is suffering for rain; wheat and grain crop injured.

Albany.—Fall wheat sown on summer fallow is in fine condition in most cases, and will in any event produce a good crop; where sown on stubble land it is stunted and speckled, and the crop will be very small, but probably better than many count on; there seems to be about the same amount of each, perhaps slightly the most of summer fallow; spring wheat is rather uncertain, but a good rain within

ten days will make a fair crop; some of it, though, it is thought, is probably beyond redemption. Altogether the crop promises to be about average.

Scio.—Rain is now badly needed for the late-sown grain and for gardens; the first crop looks well. Flax will be worthless unless plenty of rain comes soon.

Toledo, Benton county.—The past week has been very cool, but no frost. Strawberries are ripe, and gardens are looking fine. The fruit crop bids fair to be large. Crops in good condition.

Corvallis, Or. (Experiment Station).—Wheat on summer fallowed land and fall wheat will make, from appearances, an average crop: winter wheat, such as observed, has sufficient stalk, but has small head: spring wheat has made little growth this week, and the prospect for a good crop of spring wheat is very poor; there is quite a show of smut in some of the wheat; corn is needing rain badly; nearly all garden products are needing rain, and especially peas; from the number of apples on the trees and the absence of codlin moths, we can predict a good crop of apples, also pears; cherries are ripening; many varieties of grasses have been mowed during the past week; garden products have no doubt been affected by the cold nights; the temperature of the past three nights has been 36°, 36° and 30° respectively.

Philomath.—The fore part of the week was warm; on the 25th the temperature was 90°; the 26th, in the morning, clouds appeared, with cool wind; sunshine since then, which is very favorable; wheat is heading out, and is from 12 to 18 inches high; it will be high enough to cut, but without rain there will be quite light crops, and late-sown spring grain will be a failure; grain came up very well where it was rolled, and looks well; gardens generally are not up like the late grain; I take cabbage to market to-day.

Monroe.—Cherries are getting ripe; fall grain is doing tolerably well, while spring grain is needing rain badly, much of which is not up as yet.

Wells.—The past seven days have been very warm and dry; grain of all kinds and gardens are badly in need of rain.

Roseburg, Douglas county.—Rainfall, .03 inch for the past seven days; this was below the average; temperature was above the average; farmers looking anxiously for rain, and if rain don't come soon, it is generally said, it will damage cereals and fruit; general crops in good condition, also fruit; grain and wheat somewhat unfavorably affected by the weather.

Jacksonville, Jackson county.—Farmers commenced to cut alfalfa on the 26th, and a very large amount is now cut; crops in good condition; no rain during the past seven days.

The Dalles, Wasco county.—The last few days have been cool, with a northwest wind; I think it has been very favorable to crops, as it has had a tendency to raise the moisture; looks like rain, and it is needed quite bad; volunteer grain is the crop so far.

Boyd.—During the last two days high, cold west winds have somewhat revived the crops, which were suffering badly in some sections; late-sown grain has not come up well.

Monkland.—Most all grain looks healthy, but needs rain; volunteer and early grain is coming out of the boot; the weather keeps quite cool—26th, 27th and 28th being windy, but with slight indications of rain.

Fossil, Gilliam county.—Heavy frost on the 20th, destroying the gardens in some localities; grain is suffering for rain; drying up a little; spring-sown grain not up.

Maysville.—The last week has been dry; no rain; but the past three days have been windy and quite cool for the last of May. The cool wind is beneficial to the grain. The present outlook denotes rain. The grain is firing some in spots.

Lone Rock.—We need rain in all parts of Gilliam county to insure good crops. Rye has made a very good crop. Wheat looks well, and with rain will yield well. This month has been very warm. The 28th was the coldest night, there being frost enough to kill all tender plants. Minimum temperature, 28°. Apples are a good stand.

Ella, Morrow county.—June 26. Cloudy, followed by very high winds, clouds of dust continuing to date. Green peas in the market. No rain during the past week.

Eight Mile.—A bright shower on the 17th, but not enough to do any good. Spring grain is suffering for rain, and fall grain would be materially benefited by a good rain. Fall grain is jointing.

Alpine.—There have been four days clear, two days cloudy and one day fair. The past two days have been very warm. We had a shower of rain on the 19th to the amount of .25 of an inch. Solar halos on the 22d from 10 A. M. to 3 P. M. A good rain is needed to make a sure crop.

Hardman.—Weather has been variable throughout the week, with great variations of temperature and a large amount of cloudy weather and variable winds from all quarters, but chiefly north, northwest to south: from a light breeze to moderate gale on Tuesday last, with slight indications of rain. Grain crop injuriously affected by the weather. Average temperature, 57°.9.

Weston, Umatilla county.—High winds the greater part of the week; lowest temperature, 38°; slight snow in the mountains; indications are favorable for rain; in fact, at time of writing it is showery, but not enough to more than begin to lay the dust. Rain is needed. Some wheat is beginning to burn in spots, but the cool weather during the week has helped matters. Spring wheat is having the best show now, unless a good drenching rain falls.

Pleasant View.—Wheat is heading out and doing well; shower on 19th.

Walla Walla.—Rain to the amount of .14 of an inch fell on one day of the past seven; this was be-

low the average: temperature also below: all crops in excellent growing condition.

Summerville, Union county.—There has been no rain in the last seven days. One light frost, but it did not do any damage to speak of, except to tender garden plants. Grain crop in good condition.

Baker City, Baker county.—Trace of rain on one day of the past week. This is about the average rainfall. Temperature below the average. Killing frost on the 28th and 30th, almost entirely destroying unprotected tender vegetation. All crops favorably affected by the weather.

Canyon City, Grant county.—A part of the week the weather was intensely hot: the thermometer on the 26th was 93°. The grass on the hills is drying up very fast, and without rain soon will cease to grow. No grain to speak of without irrigation.

SAN FRANCISCO BULLETIN.

The following bulletin was issued by Lieut. J. E. Maxfield, signal corps, San Francisco, for the month of May, 1890:

The weather during May has been generally favorable to the growing crops in the Pacific coast States, the light rains at the end of the month in Oregon and Washington being particularly beneficial. Rain fell in Northern California on the 6th, 7th, 8th, 9th, 10th, 11th; in Southern California on the 8th, 9th, 10th, 26th and 27th; in Oregon on the 6th, 7th, 8th, 9th, 10th, 11th, 19th, 29th and 31st, and in Washington on the 8th, 9th, 10th, 11th, 19th, 29th and 31st. In Central California and Southern California the rains were light and local. The temperature has, during the greater part of the month, been higher than the normal May temperature: short periods of cool weather occurring, however, from the 6th to the 12th, and from the 26th to the 31st.

NATIONAL WEATHER-CROP BULLETIN.

The following bulletins were issued by General A. W. Greeley, chief signal officer, Washington, D. C., during May, 1890:

For the week Ending May 3, 1890.

TEMPERATURE.

The week ending May 3d has been slightly cooler than usual in New England and New York, the Lake region, and the Gulf States, while the temperature was slightly in excess in the South Atlantic States, Tennessee, the Ohio valley, Northern Virginia, Southern Pennsylvania, Maryland, Delaware, and the extreme southern portion of New York. The week has been moderately warm in the Northwest, while from Dakota westward to the Pacific coast unusually high temperatures prevailed, the daily average temperature for the week ranging from 9° to 15° above the normal.

The thermal conditions for the season, from January 1st to May 3d, remain substantially as reported for the previous week, except that the area of seasonal excess has advanced northward over portions of Iowa, Minnesota and Nebraska, and the large deficiency previously reported in the northern Rocky mountain regions has been greatly reduced by the high temperature that prevailed during the past week in that section. Over the Southern and Middle Atlantic States, the lower Lake region, and the Ohio valley, the average daily temperature from January 1st to May 3d has been about 4° above the normal for that period.

PRECIPITATION.

During the week more than the usual amount of rain occurred in New England, the lower Lake region, the Middle States north of Virginia, in Ohio, Indiana, Illinois, Missouri, and in portions of Mississippi, Arkansas, Louisiana, Texas, and Eastern Kansas. Well-distributed showers occurred generally throughout the Southern States east of the Mississippi and in the upper Lake region. Light showers occurred in Nebraska, Southern Iowa, Northern Minnesota and Central California, while no rain was reported from Northern Iowa, Dakota, and the North Pacific coast. The rainfall was generally heavy in the States north of the Ohio river and in portions of New England and the Middle Atlantic States, Mississippi, and Northern Texas.

The rainfall for the season continues in excess generally over the Ohio and Central Mississippi valleys, the Lake region, and from the Texas coast northwestward to Western Nebraska and Colorado. Over the States of the lower Missouri and upper Mississippi valleys, the seasonal rainfall generally exceeds 75 per cent. of the normal, while over the greater portion of Dakota and Western Minnesota there has been less than half the usual amount of rain. This last condition obtains in the South Atlantic States and along the East Gulf coast.

GENERAL REMARKS.

Reports from the Northwest indicate that the weather during the past week in that section has been unfavorable on account of absence of rain. The warm, dry weather has, however, favored seeding, which has been about completed. In Kansas, Missouri, Illinois, Kentucky, Tennessee and Arkansas crops were much improved by favorable weather, and corn planting is rapidly progressing. Wheat was improved in Michigan, although cold nights retarded growth, and light frosts occurred on the 30th, which caused slight damage.

Weather was unfavorable in Texas, and on low lands some replanting will be necessary.

Crops are looking well in Louisiana, except in flooded districts.

The rainfall was very unequally distributed in Mississippi, and excesses in some parts will prove injurious. The low temperature was also rather unfavorable to cotton.

In the South Atlantic States cotton and corn are reported in good condition, but more rain is needed. In New England and the Middle Atlantic States all crops were improved, and in those sections great progress was made in ploughing and planting. Oats are about planted in New York; weather was favorable to fruit. Pennsylvania wheat and grass are reported as promising and fruit prospects good.

On the Pacific coast in Oregon wheat prospects were never better. The peach and apple crops will be short, but other fruits and berries promise large yield. In California reports indicate that the peach crop has been injured badly by excessive rain, many trees destroyed along the Sacramento river; fruit prospects, however, are better in the northern portion of this valley. About an average grape crop is anticipated, while apricots and cherries are more promising.

Reports from California indicate that the weather conditions have not been favorable for the grain crops, owing to the excessive rains in many localities.

For the Week Ending May 10, 1890.

TEMPERATURE.

The week ending May 10 has been cooler than usual in all districts east of the Rocky mountains, except in Southern New England and thence southward along the coast to Wilmington, N. C., over which section the temperature has been slightly in excess. The week has also been warm from the Rocky mountains westward to the Pacific coast. Over the central valleys, the Lake region and the Northwest the daily temperature for the week ranged from 3° to 6° below the normal. The thermal conditions for the season, from January 1 to May 10, remain substantially as reported during the preceding week, and although the season has been unusually warm from the Gulf coast to the Lake region, crop conditions over this region are generally reported ten to fifteen days late. In the Northwest, including Minnesota, the Dakotas and Nebraska, the seasonal temperature differs but slightly from the normal.

PRECIPITATION.

The region of excessive rainfall for the present week includes almost the entire country east of the Mississippi, and portions of Arkansas, Eastern Texas, Louisiana and South Dakota. Although less than the usual amount of rain occurred in the Missouri valley and the central portions of Ohio, Indiana and Illinois, general showers are reported from these sections, where the rainfall for the week generally exceeded .5 of an inch. In the Southern portion of the East Gulf States, and in Southern Georgia and Northern Florida, where rain was greatly needed, the precipitation for the week was from 2 to 4 inches. Heavy rains also occurred in Central North Carolina, along the New England coast and in Southern Wisconsin. Excessive rains are also reported in North-

ern California and Western Oregon. Dry weather continues in the northern portions of Minnesota and North Dakota, over which region only light showers occurred during the week. The seasonal rainfall continues in excess generally over the central valleys, the Lake region, the northern portion of the Middle Atlantic States, and in New England, and also on the Pacific coast north of the thirty-fifth parallel. The recent rains over the South Atlantic and East Gulf States have greatly reduced the seasonal deficiency in rainfall in that section, and at present the rainfall over a greater portion of this section amounts to about 50 per cent. of the normal. Over a large portion of North Dakota and Western Minnesota the rainfall for the season has been less than one-half the usual amount. In Central Iowa, Northwestern Missouri and Northeastern Nebraska about 75 per cent. of the normal rainfall has occurred.

GENERAL REMARKS.

The weather was generally unfavorable for growing crops throughout the central valleys, the Lake region and Middle Atlantic States, owing to the unusually low temperature, which was attended by light frosts as far south as Tennessee and South Carolina. These frosts caused some damage to vegetables and fruit in the Mississippi valley, and the cold weather retarded growth of the principal crops in all sections.

Rain is much needed in Minnesota, Dakota, Nebraska and Eastern Kansas, while in Western Kansas most favorable crop conditions are reported. More favorable reports have been received from the West Gulf States, and in Arkansas corn and cotton have improved, and portions of these crops are being worked. Crops are growing favorably in Louisiana, where rice planting is in progress on previously flooded lands. Texas reports farmers three weeks behind with work.

In the South Atlantic and East Gulf States, although too cool for cotton, the week was generally favorable, and from Alabama eastward to North Carolina, crop conditions are reported as very good.

In the Middle Atlantic States farm work was delayed by rain and cool weather, but the staple crops are reported in good condition.

Frosts on the 9th in the Middle Atlantic States did little damage, and the fruit prospects are generally reported as good.

In California grain and fruits of all kinds were improved in all parts of the State by favorable weather. The outlook is good, and the indications are that Southern California will produce its largest fruit crop. In Oregon crops are reported as growing finely, wheat promising, but more rain would prove beneficial.

For the Week Ending May 17, 1890.

TEMPERATURE.

The week ending May 17th has been warmer than usual along the Atlantic and Pacific coasts and

cooler in the Central valleys, the Lake region and the Northwest. The deficiency in temperature has been most marked in States of the upper Mississippi valley and the Dakotas, where the daily temperature has ranged from 6° to 10° lower than usual, and where the cool weather continues this morning with local snows. The temperature for the season, January 1st to May 17th, continues in excess in all agricultural districts east of the Rocky mountains and south of the forty-second parallel. The seasonal excess in temperature over this region, though marked, is apparently growing less. The deficiency in temperature for the season previously reported for the extreme Northwest is also growing less, and with the advance of the season the thermal conditions are apparently approaching the normal both in the regions of excess and deficiency in temperature.

PRECIPITATION.

The region of excessive rainfall during the present week is substantially the same as that of the previous week, and includes almost the entire country east of the Mississippi, except along the immediate East Gulf coast. Generous showers also occurred in the West Gulf States, and light showers in the Missouri valley and in the Northwest. There was also an excess of rainfall in Central and Northern California. Very light showers occurred on the North Pacific coast and over the greater portion of the Dakotas and Minnesota. The rainfall for the season, January 1st to May 17th, continues in excess generally over the Central valleys, the Lake region, New York and Pennsylvania, and the interior of New England. The deficiency previously noted in the South Atlantic and East Gulf States has been reduced, and the seasonal rainfall over those sections amounts to more than 50 per cent. of the normal. There is a large deficiency in seasonal rainfall from Central Minnesota westward to the Missouri valley and Northwest Dakota. Over this section less than 40 per cent. of the usual rainfall has occurred, although showers were reported in this section this morning. About 60 per cent. of the seasonal rainfall has occurred in Northern Kansas and Northwest Missouri, while there has been an excess of rainfall in Western Nebraska and Northern Colorado.

GENERAL REMARKS.

The weather during the past week in the Northwest, including the States of the Missouri and upper Mississippi valleys and upper Lake region, was generally unfavorable for growing crops, owing to low temperature, which was accompanied by frosts, causing some injury to fruit and retarding growth of crops.

Drought continues over portions of Minnesota and North Dakota, where high winds have rendered some replanting necessary. More rain is needed in Kansas and Nebraska, while the excessive rainfall in the States of the Ohio valley, attended by cold

weather, has retarded farm work, the ground being too wet for planting.

Kentucky reports tobacco plants late and scarce and other crops fair. Tennessee reports weather unfavorable and outlook discouraging—farmers greatly behind in their work. Some damage is reported to wheat and oats from rust, but the tobacco prospect is more favorable.

In the West Gulf States the weather conditions during the past week have caused some improvement, although, owing to low temperatures, growth of crops has been slow. The replanting of cotton and rice is in progress in districts previously flooded, and in Texas wheat is damaged by rust. Cotton has been injured by cool weather and excessive rains in Mississippi.

In the South Atlantic States conditions are more favorable, and cotton, corn and potatoes are reported as very good. Although planting has been delayed by rains in New England and the Middle Atlantic States, the crop and fruit conditions are reported as favorable and grass and grain excellent.

The weather conditions were favorable on the Pacific coast and crops were improved, but a continuation of dry weather in Oregon will result in some injury to the grain crops.

For the Week Ending May 24, 1890.

TEMPERATURE.

About the normal temperature has prevailed in the Southern States, the Ohio valley, and on the New England coast during the past week, while the cold weather has continued in the Lake regions and the Northwest, the average daily temperature in the upper Lake region and the upper Mississippi valley ranging from 5° to 10° below the normal. The week has been warm in the Rocky mountain regions and on the Pacific coast. The temperature for the season, from January 1 to May 24, continues above the normal throughout the States east of the Mississippi and in the Southwest, although the departure is less than at the opening of the month. In the Northwest, where the season has been colder than usual, the daily average temperature for the entire period has only been about 2° below the normal.

PRECIPITATION.

There has been more rain than usual during the week in the interior of New England and the Middle Atlantic States, the Lake regions, West Virginia, Upper Ohio valley, East Tennessee, Southern Minnesota, Southeast Dakota, and portions of Iowa, Missouri and Illinois. Well-distributed showers occurred throughout the Southern States, and generally from Texas northward to Dakota. Very heavy local rains are reported from Eastern Missouri, Western Pennsylvania and Eastern Iowa, where the rainfall exceeded 2 inches. Over the grain regions of Southern Minnesota and Southeast

Dakota the rainfall exceeded 1.5 inches, while in the northern portions of these States about .5 of an inch of rain is reported. No rain occurred on the Pacific coast south of Oregon.

The seasonal rainfall continues in excess generally throughout the Northern States east of the Mississippi and in Tennessee, the Ohio valley, Arkansas and Texas. There has also been an excess of rain in Western Nebraska and on the Pacific coast north of the thirty-fifth parallel, and in the extreme northern portion of Minnesota. In the South Atlantic and southern portions of the East Gulf States the deficiency of rainfall since January 1 ranges from 10 to 15 inches, or about one-half of the normal rainfall has occurred. In Kansas and Eastern Nebraska about 60 per cent. of the normal rainfall is reported, while in Central Minnesota, and thence westward to the Missouri valley, including the belt of country extending from Moorhead westward to Bismarck and Fort Buford, the rainfall for the season has been less than 40 per cent. of the usual amount for that region, while in Southern Minnesota the seasonal rainfall generally exceeds 75 per cent. of the normal.

GENERAL REMARKS.

The recent rains in the Northwest have greatly improved the crop conditions in that section, including the States of Minnesota, Dakota, Nebraska and Iowa, although local droughts are reported in North Dakota and Northwest Minnesota. While the rains have been favorable for small grain, it has been too cool for corn, which is being replanted in some sections of Iowa, Illinois and Missouri.

In Kansas the weather for the week was not so favorable, and crops were injured in some sections, except in the southeast, where wheat was improved. Cold and wet weather has retarded seeding in Michigan and Indiana, where conditions are generally reported as unfavorable, except that the grass crop has been improved.

In Tennessee, Kentucky and Arkansas crop conditions are reported as improving. Kentucky reports: "Tobacco plants not doing well; wheat fair; fruit prospects improving." Tennessee reports: "Wheat injured by rust, half crop; oats failure; other crops growing well; tobacco favorable; cotton improving; outlook better."

In the Gulf States the weather was generally favorable, and crops improved rapidly during the latter part of the week, although the season is from ten to twenty days late. In the lower Mississippi valley the back water is receding slowly, and replanting is in progress. In the South Atlantic States cool nights retarded the growth of cotton, which, however, is reported in excellent condition. The oat harvest is in progress in South Carolina, with fair prospect; wheat is reported in poor condition; corn and potatoes good.

Cool, wet weather in New England and the Middle Atlantic States has retarded the growth of crops

and delayed farm work, although grass and grain are generally reported in good condition. The week was unfavorable in New Jersey for tender vegetables, and the condition of the corn crop is unfavorable from North Carolina northward, owing to wet weather and delay in planting.

Reports from California state that the weather during the early part of the week was favorable for fruit and grain, and that during the latter part of the week unfavorable northerly winds occurred in the Sacramento valley. Grain and fruit prospects continue good in Oregon: light showers on Monday proved very beneficial, but more rain is needed.

For the Week Ending May 31, 1890.

TEMPERATURE.

The past week has been slightly cooler than usual in the Southern and the Middle Atlantic States and near Lake Superior, and decidedly cooler on the New England coast, where the daily temperature was about 6° below the average of the week as determined from previous years. The week was slightly warmer than usual in the Ohio valley and the lower Lake region, and from the Missouri valley westward to the plateau region, the greatest excess in temperature being to the west of the Rocky mountains.

The temperature for the season, from January 1 to May 31, has been above the normal, except in the Northwest, on the Pacific coast, and in Northern New England. The greatest seasonal excess in temperature is reported from the Middle Atlantic coast, where the daily average for the entire period has been about 5° above the normal. Over the Southern States, the Ohio valley, and the lower Lake region, the daily excess ranges from 2° to 4°, while in the Central Mississippi valley it amounts to less than 2°. Generally in the region where the seasonal temperature has been below the normal, the daily deficiency amounts to less than 2°, except in Montana, where it is 6°.

PRECIPITATION.

The rainfall conditions during the past week are similar to those of the past two weeks. Excessive rains continue over the greater portion of the country east of the Mississippi, and during the past week the excessive rains have extended over the Missouri valley, Kansas and Louisiana. The heaviest rainfalls occurred over the Gulf and South Atlantic States, where great deficiency in seasonal rainfall exists. Heavy rains also occurred over Eastern and Southern Minnesota, and numerous showers were reported in Nebraska and the Dakotas. Although the rainfall was deficient in Kentucky, Tennessee and Arkansas, the rainfall in those States generally exceeded five-tenths of an inch. Light showers occurred on the North Pacific coast and in Southern California, but no rain was reported in Northern California. The

rainfall for the season continues in excess in the Northern States east of the Mississippi, in Tennessee, Kentucky, Arkansas and Texas. In the belt of country extending from Western Pennsylvania southwestward to Indian Territory there has been about one-half more rain than usual. The recent rains in the Southern States have greatly reduced the deficiency in that section, and at the close of the week a large portion of this area had received about 75 per cent. of the seasonal rainfall, although along the East Gulf coast, and near Savannah, the seasonal rainfall amounted to less than one-half the normal. The drought continues in portions of North Dakota and in Northwest Minnesota between Moorhead and Bismarck, where the deficiency in rainfall for the season amounts to about five inches, or where only about 35 per cent. of the usual amount of rain has occurred.

GENERAL REMARKS.

The weather during the past week was favorable to all growing crops in the Northwest and the Ohio valley. Crop prospects are reported as excellent in Minnesota, and have improved in the Dakotas, Nebraska and Iowa, although more rain is needed in the Missouri valley. The condition of the corn crop is greatly improved throughout the Central valleys, although cut-worms are reported as doing some damage in South Dakota and Iowa. The winter wheat crop is generally in poor condition, and in Central Illinois many fields are being plowed for other crops, although some improvement is reported in this crop in Indiana and Kentucky. The condition of the tobacco plant is improved in Kentucky and Tennessee, but in these States wheat is poor and oats almost a failure.

Crops were much improved in the Southwest, including Arkansas, Texas and Louisiana, by favorable weather, although in some sections the nights were too cool for cotton. Excessive rains did some damage to crops in Mississippi and South Carolina, and in the former State cotton is dying in some sections. All crops reported in good condition in Alabama, and in North Carolina the general condition is reported as excellent.

In New England and the Middle Atlantic States the weather conditions were not generally favorable, owing to excessive rains and low temperature, although prospects are reported as good for staple crops in Pennsylvania, where grass is excellent. Wet weather injured grain in New York, where the prospects for fruit are good, but dry weather is needed. Some injury resulted to the fruit crop in New Jersey, owing to wet weather, and frost caused some damage in Southern New England.

Light showers which occurred in Oregon proved

very beneficial and assure a good crop of cereals. Fruit in that section promises a large yield. The weather in California was favorable for all crops.

THERMOMETRIC OBSERVATIONS.

At the Oregon Experiment Station and Agricultural College at Corvallis observations of the direct heat of the sun (max. solar), and of the nocturnal radiation (min. terrestrial), are now being made, in addition to complete meteorological observations. The first observations of the maximum solar and minimum terrestrial thermometers were begun on May 7th, and will be continued daily. From the instruments now at the station, in addition to other meteorological data, there are now obtained: The amount of heat received from the sun, the amount retained by the earth, the amount radiated from the earth, the degree of heat and cold of the air. These are all of vital importance in connection with the study of growth and propagation of vegetation and the influence of climate thereon.

The observations for May show a similar movement between the direct heat from the sun and the heat of the air. There was more fluctuation, however, of the air temperature than of the direct rays.

The relation between the minimum air temperature and the amount of heat radiated from the earth is even more closely shown. The temperature which plants of all kinds had to endure during May was on an average $3^{\circ}.5$ lower than that of the air 10 feet above the earth's surface. On cloudy nights the radiated heat is almost nothing, seldom amounting to over 1° . On clear nights, and especially on those having fresh winds, the difference amounts to as much as 7° . On the night of the 30th the air at a height of 10 feet above the ground had for its minimum temperature 34° , while the vegetation within one foot of the ground had to sustain a temperature of 30° , 2° below the freezing point, a temperature sufficiently low to destroy all vegetation, and reports indicate that considerable was injured.

The days on which the difference between the solar and maximum air heat is the greatest, the difference between the minimum air and minimum terrestrial heat is the least, what the relation may be between the temperature of the air and the temperature of the plants, will be determined in the course of these observations.

This work has just begun, and results will be sure to follow that will accrue to the agricultural interests of the State. Careful observations, close study of cause and effects will produce results which will eventually prove to be of incalculable benefit.

TABLE GIVING AVERAGE DATA.

The following table gives the average data for each hour of the day, local time, from self-registering instruments, at Portland, Forest Grove, Corvallis, and Roseburg, during the month of May, 1890.

Data.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.
Mean actual barometric pressure at Portland	29.97	29.97	29.98	29.98	29.98	29.99	29.99	29.99	29.99	29.98	29.97	29.96
Mean actual barometric pressure at Forest Grove	29.87	29.88	29.88	29.88	29.88	29.89	29.89	29.89	29.89	29.89	29.88	29.87
Mean actual barometric pressure at Corvallis	29.73	29.73	29.73	29.73	29.73	29.73	29.74	29.75	29.75	29.74	29.74	29.73
Mean temperature at Portland	54.1	52.7	51.8	50.8	50.2	51.9	54.5	56.8	58.8	61.1	63.2	65.6
Mean temperature at Corvallis	51.0	51.0	50.0	50.0	49.0	50.0	52.0	56.0	59.0	61.0	63.0	65.0
Mean temperature at Roseburg	51.5	50.2	49.4	48.7	48.1	49.8	52.9	55.6	58.7	61.1	63.7	66.2
Average movement of wind, in miles, at Portland	3.4	2.5	2.5	2.7	1.7	2.3	3.4	5.4	5.5	5.7	6.5	6.7
Average movement of wind, in miles, at Forest Grove	0.8	0.9	0.6	0.8	0.4	0.3	0.8	0.9	1.6	2.2	2.2	2.2
Average movement of wind, in miles, at Corvallis	5.7	4.8	4.3	3.9	3.7	3.5	3.7	4.4	6.2	6.9	7.4	9.0
Average movement of wind, in miles, at Roseburg	1.2	1.1	1.2	1.4	1.2	1.2	1.4	2.1	2.9	3.5	3.6	4.3

TABLE GIVING AVERAGE DATA—CONCLUDED.

Data.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Mid-night.	Av. for month.
Mean actual barometric pressure at Portland	29.95	29.94	29.92	29.91	29.99	29.90	29.91	29.93	29.94	29.95	29.96	29.97	29.96
Mean actual barometric pressure at Forest Grove	29.86	29.85	29.84	29.83	29.82	29.82	29.83	29.84	29.85	29.86	29.87	29.88	29.86
Mean actual barometric pressure at Corvallis	29.72	29.71	29.70	29.69	29.69	29.69	29.69	29.70	29.71	29.72	29.72	29.73	29.72
Mean temperature at Portland	67.5	69.4	70.4	69.5	69.5	67.9	65.8	62.5	60.5	58.8	57.3	55.1	60.2
Mean temperature at Corvallis	67.0	68.0	68.0	68.0	67.0	65.0	62.0	58.0	57.0	55.0	54.0	52.0	58.4
Mean temperature at Roseburg	68.1	69.1	70.2	70.2	69.3	66.9	64.5	61.8	57.9	57.4	55.1	53.7	59.2
Average movement of wind, in miles, at Portland	7.3	6.8	7.3	8.3	8.5	8.4	7.5	7.1	6.9	5.9	5.3	4.3	5.5
Average movement of wind, in miles, at Forest Grove	2.6	2.6	3.5	4.9	4.6	4.2	3.1	2.6	2.5	2.3	1.7	1.5	1.6
Average movement of wind, in miles, at Corvallis	10.6	10.9	13.4	16.4	17.3	17.3	15.2	12.7	11.4	9.1	7.9	6.4	8.8
Average movement of wind, in miles, at Roseburg	4.9	6.4	6.8	8.3	8.3	8.5	7.9	5.9	3.8	1.9	1.5	1.2	3.8

The above table shows the highest pressure at 8 and 9 a. m., the lowest at 5 and 6 p. m. It shows the lowest temperature to have been at 5 a. m., one hour earlier than in April, and the highest at 3 p. m. The highest pressure follows the lowest temperature by three hours, and the lowest pressure the highest temperature by three hours. It shows the least velocity of the wind at 5 a. m.; the greatest at 5 and 6 p. m. The least velocity of the wind occurred at the time of the lowest temperature; the greatest followed the highest temperature and accompanied the lowest pressure. From this may be deduced: The time of greatest cold during the day the air has its least movement, and the greatest barometric pressure follows; following the time of the greatest heat the velocity is the greatest and the barometric pressure the least. The rapid decline in temperature after 5 p. m. is accompanied by a rising barometric pressure and a less velocity of the wind. The high velocity at Corvallis may be explained by the fact that the great Willamette valley becoming heated, the air rises and the cool sea breeze, coming through a cut in the Coast range to the west of Corvallis, to fill the space caused by the warmer and more rarified air, causes a strong sea breeze and cool wind to be experienced of considerable velocity. From 8 a. m. to noon the temperature at Portland, Corvallis and Roseburg is nearly the same. From 12 noon, to 8 a. m. the temperature is lower at Corvallis than Portland and lower than at Roseburg from noon to 1 a. m.; at Roseburg it is cooler from 1 a. m. to 7 a. m. than at Portland or Corvallis.

VELOCITY AND DIRECTION OF WIND.

Table showing total number of miles of wind, and the number of hours and minutes that the wind blew from each point of the compass, during May, 1890, as recorded at the central office, Portland, Or. Percentage of miles and time recorded in lower line.

North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		*Calm.	
Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.
727	97:50	34	5:40	19	2:40	127	26:15	774	94:50	223	23:50	186	22:10	1472	170:55	508	305:50
17.9	13:1	0.8	0:8	0.5	0:4	3.1	2:7	19.0	12:7	5.5	3:2	4.6	3:0	36.2	23:0	12.5	41:1

* Velocities of 4 miles an hour or less, are, in this data, considered a calm.

The average for the month shows that it took 6 minutes for 1 mile from the southwest, 7 minutes for one mile from the south, west and northwest, 8 minutes for 1 mile from north and east, 9 minutes for 1 mile from southeast, and 10 minutes for 1 mile from the northeast. Deduction—The wind during May had the average highest velocity from the southwest, and the least average velocity from the northeast.

SOIL TEMPERATURES.

Table showing daily maximum, minimum, and mean air temperature at Pendleton, Oregon, during April, 1890; also the daily temperature of the soil at depths of 4, 8, 12, and 24 inches below the surface, together with the total daily precipitation. Soil thermometer observed at 3 P. M., daily.

Data.	May, 1890.																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean
Maximum temperature.....	78	85	80	83	87	91	90	88	60	72	58	66	74	77	84	72	74	76	70	73	71	76	80	85	81	89	66	65	63	72	71	75.0
Minimum temperature.....	48	43	59	41	40	44	48	52	42	42	49	43	40	43	41	56	48	38	46	54	40	34	57	44	47	39	51	44	45	30	46	45.2
Mean temperature.....	63	64	70	62	64	68	69	55	51	57	51	55	57	60	61	61	61	57	58	61	56	55	68	64	64	64	58	54	54	51	59	60.1
Soil temperature, depth of 4 in.	73	76	76	78	78	81	80	60	66	70	60	65	70	69	76	72	73	74	64	61	72	72	76	78	80	80	74	70	63	71	69	72.3
Soil temperature, depth of 8 in.	67	68	70	70	70	72	72	64	61	62	59	60	62	62	66	66	66	66	63	63	65	66	68	70	72	72	70	66	63	64	65	66.3
Soil temperature, depth of 12 in.	63	63	64	64	65	66	67	65	61	60	60	58	59	60	61	63	62	62	62	62	62	62	63	65	66	66	67	65	64	62	63	63.1
Soil temperature, depth of 24 in.	58	59	60	60	61	62	62	62	62	60	60	59	59	59	59	60	60	60	60	60	60	61	61	62	62	63	64	64	63	62	62	60.9
Total precipitation.....							.53	.12			.75									.01										.07		1.51

Boldfaced figures are the extremes of each horizontal column.

LIST OF CROP-WEATHER CORRESPONDENTS.

BAKER COUNTY.

C. H. Stuller.....Baker City W. R. Gradon.....Burns
L. S. Wilcox.....Haines J. H. Neal.....Diamond

BENTON COUNTY.

Oregon Experiment Station.....Corvallis F. H. Carter.....Ashland
W. S. Tomlinson.....Wells Peter Britt.....Jacksonville
Miles T. Starr.....Monroe
Dr. H. W. Vincent.....Toledo
J. S. S. Powell.....Philomath Dr. John G. Jessup.....Grant's Pass

CLACKAMAS COUNTY.

A. O. Kruse.....Wilsonville
A. R. Shipley.....Oswego
J. N. Harrington.....Highland
J. P. Logan.....Union Mills U. F. Absheir.....Silver Lake
J. E. Jack.....Butte Creek S. C. Beach.....Lakeview

CLATSOP COUNTY.

J. N. Griffin.....Astoria State University.....Eugene

COLUMBIA COUNTY.

John Macdonald.....St. Helens M. C. Close.....Creswell
G. W. Dallas.....I. L. Simpson.....Siuslaw

COOS COUNTY.

George Bennett.....Bandon John Briggs.....Albany
C. J. Shedd.....Shedd
N. P. Payne.....Albany
Newton Crabtree.....Seio

CROOK COUNTY.

J. A. Douthitt.....Prineville
M. E. Spafford.....Hardin

CURRY COUNTY.

F. S. Moore.....Ellensburg T. L. Arnold.....Beulah
J. R. Blackaby.....Jordan Valley

DOUGLAS COUNTY.

Thos. Gibson.....Roseburg Dr. Urban Fisher.....Mount Angel
J. T. Gray.....Gardiner W. H. Goudy.....Hubbard
E. F. Walsh.....Olalla Archie Libby.....Jefferson
C. T. Miller.....Turner
F. R. Smith.....Salem
J. B. Stump.....Salem
H. E. Hilleary.....Turner

GILLIAM COUNTY.

W. H. Colwell.....Lone Rock
Benton Mires.....Fossil
W. J. Edwards.....Mayville

GRANT COUNTY.

E. S. Penfield.....Canyon City Arthur Smith.....Heppner
Henry Hall, Sr.....Prairie City Dr. J. R. Lord.....Ella
D. I. Asbury.....Canyon City E. H. Andrews.....Alpine
Florence Bleakman.....Hardman
C. E. Jones.....Eight Mile

MORROW COUNTY.

MULTNOMAH COUNTY.

Dr. Geo. Wigg-----East Portland
CENTRAL OFFICE-----Portland

POLK COUNTY.

Thos. Pearce-----Eola
Finley Edgar-----Crowley

SHERMAN COUNTY.

C. C. Myers-----Wasco
C. H. Belcher-----DeMoss Springs
Presley King-----Ersleville
C. W. Thompson-----Monkland
A. D. McDonald-----Monkland

TILLAMOOK COUNTY.

A. P. Wilson-----Tillamook

UMATILLA COUNTY.

P. Zahner-----Pendleton
M. A. Baker-----Weston
H. S. Blandford-----Walla Walla, Wash
W. A. Sample-----Helix
John S. Vinson-----Nolin
S. Rothchild-----Pendleton
A. C. Wellman-----Estes, Wash

UNION COUNTY.

J. K. Romig-----La Grande
Jas. H. Chattin-----Summerville
W. C. Cusick-----Telocasset
G. Venable-----North Powder

WALLOWA COUNTY.

W. A. Leslie-----Joseph

WASCO COUNTY.

S. L. Brooks-----The Dalles
Dr. E. J. Thomas-----Hood River
William Holden-----Grass Valley
C. P. Balch-----Dufur
P. P. Underwood-----Boyd
S. R. Husbands-----Mosier
C. D. Butler-----Kingsley
H. C. Crockett-----The Dalles

WASHINGTON COUNTY.

Prof. G. W. Shaw-----Forest Grove
Marion Koger-----Dixie
John Henry-----Beaverton
W. K. Curtis-----Forest Grove

YAMHILL COUNTY.

Wyatt Harris-----McMinnville
M. W. Gumm-----Oak Fir Orchard (Newberg)

In addition to the above correspondents, clippings from eighty-eight Oregon newspapers are used in the reports of this bureau.

More correspondents are wanted in every county to report weekly the general weather and crop conditions, effects of the weather, progress of crops, etc.



